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A MANUAL  
OF  
PRACTICAL OBSTETRICS:

ARRANGED SO AS TO AFFORD

A CONCISE AND ACCURATE DESCRIPTION

OF THE

**Management of Preternatural Labours;**

PRECEDED BY AN ACCOUNT OF THE

MECHANISM OF NATURAL LABOUR.

FROM THE FRENCH OF

**JULIUS HATIN,**

*Doctor of Medicine of the Faculty of Paris, Professor of Obstetrics and of the Diseases of Women and Children, &c. &c.*

BY S. D. GROSS, M. D.

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WITH AN APPENDIX, CONTAINING

A PHYSIOLOGICAL MEMOIR UPON THE BRAIN.

FROM THE FRENCH OF M. MAGENDIE,

BY JOSEPH GARDNER, M. D.

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PHILADELPHIA:

J. GRIGG, NO. 9, NORTH FOURTH STREET.

1828.



*Eastern District of Pennsylvania, to wit:*

BE IT REMEMBERED, that on the fourth day of November, in the fifty-third year of the Independence of the United States of America, A. D. 1828, John Grigg of the said district hath deposited in this office the title of a book, the right whereof he claims as proprietor in the words following, to wit:

“A Manual of Practical Obstetrics: Arranged so as to Afford a Concise and Accurate Description of the Management of Preternatural Labours; Preceded by an Account of the Mechanism of Natural Labour. From the French of Julius Hatin, Doctor of Medicine of the Faculty of Paris, Professor of Obstetrics and of the Diseases of Women and Children, &c. &c. By S. D. Gross, M. D. With an Appendix, Containing a Physiological Memoir upon the Brain. From the French of M. Magendie, by Joseph Gardner, M. D.

In conformity to the act of the Congress of the United States, entitled “An act for the encouragement of learning, by securing the copies of maps, charts, and books to the authors and proprietors of such copies during the times therein mentioned;”—And also to the act entitled “An act supplementary to an act entitled ‘An act for the encouragement of learning by securing the copies of maps, charts, and books to the authors and proprietors of such copies during the times therein mentioned,’ and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints.”

D. CALDWELL.

*Clerk of the Eastern District of Pennsylvania.*



TO

**THE MEDICAL STUDENTS**

THROUGHOUT THE UNITED STATES,

THE FOLLOWING PAGES,

PREPARED CHIEFLY FOR THEIR USE,

ARE RESPECTFULLY INSCRIBED.

*Philadelphia, September, 1828.*





OF THE

**MANAGEMENT**

OF

**PRETERNATURAL LABOUR.**

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THE management of preternatural labour has for its object the extraction of the fœtus from the genital parts of the mother.

This extraction is sometimes performed exclusively by means of the hands; sometimes by the aid of blunt instruments, and sometimes again by means of operations performed upon the mother or the infant. From this simple exposition, it is obvious, that preternatural labours may be divided into three classes according to the manner in which they terminate.

In the first two classes the parts are generally well formed, and the obstacle to the termination of the labour often depends on a defect of the relations which exist between the diameters of the pelvis of the mother and those of the fœtus. From this it is evident, that it is of the utmost importance to distinguish this kind of obstacle, and in order, therefore, to afford the proper remedy for its removal, it is necessary that we should be possessed of a tho-

rough knowledge of all the details of the mechanism of natural labour.

In order to be well acquainted with this mechanism, we should have an accurate knowledge of the interior parts of the osseous canal of the pelvis of the mother, and of the principal parts of the fœtus at the full term of utero-gestation, such as the head, the shoulders, and the breech. It is, in fact, upon the relations which exist between these different parts that is based the mechanism of natural labour.

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## PART I.

### *Of the Pelvis of the Mother.*

The pelvis is a kind of osseous canal, situated at the base of the trunk, between the vertebral column, which rests upon its middle and posterior part, and between the ossa femora, which are articulated with its antero-inferior parts.

The pelvis is divided into an external surface, an internal surface, a base, and a summit.

We shall treat here only of the internal surface, because it is the only one that is useful to be known in order to explain the mechanism of natural labour.

The internal surface of the pelvis comprehends the great pelvis, the superior strait, the cavity of the pelvis, and the inferior strait.

*Great pelvis.*—The great pelvis is divided into four regions, an anterior, a posterior, and two lateral.

*Anterior region.*—The anterior region exists only



in the recent state, and is formed entirely by the parietes of the abdomen.

*Posterior region.*—It presents in its middle the termination of the vertebral column, and laterally the marks of the sacro-iliac symphyses.

*Lateral regions.*—They are formed by the internal iliac fossæ, which are occupied in the recent state, by the psoæ and iliac muscles.

### *Dimensions of the great pelvis.*

*Width.*—The width of the pelvis from one iliac crest to the other is about 10 inches; from one antero-superior spinous process to the other, about 9 inches, and from one antero-inferior spinous process to the other, about 8 inches.

*Depth.*—From the middle of the iliac crest to the superior strait, about three inches and a half, and to the level of the antero-superior spinous process of the ilium, about three inches.

*Extent from behind forwards.*—The extent of the great pelvis can not be determined in this direction, on account of the parietes of the abdomen, which are susceptible of more or less considerable extension.

*Superior strait.*—This is the osseous border which separates the great from the small pelvis.

*Form.*—It varies in its form, though most frequently it is elliptical.

*Dimensions.*—The superior strait has four diameters, viz., an antero-posterior, which extends from the sacro-vertebral angle to the symphysis pubis; a transverse, which extends from one side of the pelvis to the other, and two oblique, which extend from the sacro-iliac symphysis of one side, to the linea

ilio-pectinea of the opposite. The antero-posterior diameter measures four inches; the transverse, on the skeleton, five inches; but in the recent state it is about half an inch less on each side, in consequence of the presence of the psoæ and iliac muscles; so that it really measures but four inches. The oblique diameters measure each four inches and a half.

*Inclination.*—When the woman is in the erect posture, the superior strait is not situated horizontally, but its posterior part is much more elevated than its anterior; so that it is directed obliquely from above downwards, and from behind forwards, and presents an inclination from about 35 to 40 degrees.

*Axis.*—The axis of the superior strait may be represented by an imaginary line, which shall commence at the umbilicus, pass through the centre of the superior strait, and terminate at the inferior part of the sacrum.

*Cavity of the pelvis.*—The cavity of the pelvis is divided into four regions, an anterior, a posterior and two lateral.

*Anterior region.*—The anterior region is slightly concave from one side to the other, and presents the posterior part of the symphysis and body of the pubis; more externally and towards either side is the foramen thyroideum, which is filled up by the obturator internus muscle.

*Posterior region.*—The posterior region is formed by the anterior face of the sacrum and os coccygis. It is concave and presents the transverse lines which indicate the place of union of the different pieces of which the sacrum and the os coccygis are composed. It presents also the anterior sacral foramina which gives passage to the anterior sacral nerves,



*Lateral regions.*—The lateral regions are almost plane, being inclined from above inwards, and presenting the sciatic fissures, which, in the recent subject, are converted into foramina by the sciatic ligaments; a square surface corresponding to the acetabulum, and the spinous process of the ischium, which projects more within the pelvis than the parts which are situated before and behind it, and gives rise, on either side, to two inclined planes, an anterior and a posterior. During labour these inclined planes rotate the head of the child in such a manner as to carry its antero-posterior diameter in the direction of the greatest diameter of the inferior strait. The anterior plane of one side enables the part of the head, which is directed in front, to glide under the arch of the pubes, while the posterior of the opposite side causes the part, which is directed backwards, to glide into the hollow of the sacrum.

### *Dimensions of the Cavity of the Pelvis.*

*Antero-posterior diameter.*—This diameter extends from the middle of the symphysis pubis to the middle of the sacrum, and measures about 5 inches, in consequence of the hollow of the sacrum which is about one inch deep.

*Transverse diameter.*—Above the cavity of the pelvis, about  $4\frac{1}{2}$  inches.

This extent diminishes in proportion as we approach the inferior part of the pelvis.

*Depth.*—The anterior paries measures about 18 lines; the posterior, without following the curve of the sacrum,  $4\frac{1}{2}$  inches, and the lateral parietes  $3\frac{1}{2}$  inches.

*Direction.*—The cavity of the pelvis represents

a canal which is considerably curved forwards, and cut perpendicularly to its axis at each extremity.

*Axis.*—The axis of the cavity of the pelvis may be represented by a curved line which shall pass through the middle of the canal, so as to follow very nearly the curve of the sacrum.

*Inferior strait.*—This is formed by the inferior opening of the pelvis. Its contour is osseous in front and upon the sides, while behind it is almost entirely ligamentous.

*Form.*—Very irregularly rounded.

*Dimensions.*—The inferior, like the superior strait, has four diameters; an antero-posterior, which extends from the point of the os coccygis to the inferior part of the symphysis pubis; a transverse diameter, which goes from one tuberosity of the ischium to the other, and two oblique, which extend from the tuberosity of the ischium on one side, to the middle of the sacro-sciatic ligament of the opposite.

All these diameters are generally 4 inches in extent; but the antero-posterior may be carried as far as 5 inches by the retrocession of the os coccygis.

*Direction of the inferior strait.*—Its posterior part, as far as the tuberosities of the ischia, is inclined downwards and backwards, while its anterior part is directed downwards and forwards. This last part constitutes what is called the arch of the pubes.

*Dimensions of the arch of the pubes.*

*Width.*—Superiorly, from 15 to 20 lines; in the middle  $2\frac{1}{2}$  inches, and inferiorly 4 inches.

*Height.*—About 2 inches.

*Axis of the inferior strait.*—The axis of the in-

ferior strait may be represented by an imaginary line which shall begin at the sacro-vertebral angle, and pass through the centre of this strait.

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#### OF THE PRINCIPAL PARTS OF THE FŒTUS.

The most important parts of the fœtus that are concerned in labour, are the head, the shoulders, and the breech. But as an intimate knowledge of these parts is not necessary to explain the mechanism of natural labour, we shall confine our attention merely to what relates to their form and volume.

#### OF THE HEAD OF THE FŒTUS.

The head of the fœtus, when separated from the trunk, is of an ovoid form, and slightly flattened in various directions.

*Division.*—The head is generally divided into five regions and two extremities.

The regions are the vertex or crown, the base, the face properly so called, and the temporal regions.

The two extremities are represented, the one by the tubercle of the os occipitis, and the other by the chin.

The vertex of the head presents some parts which are important to be known to the accoucheur. The principal are the anterior fontanelle, the sagittal suture, and the posterior fontanelle.

The base of the cranium is never presented, unless the head is separated from the trunk.

The face, properly so called, is so well characterized that it is easily distinguishable.

The temporal regions have sutures and fonta-



nelles, and when they present, they are particularly distinguishable by the presence of the ear.

### *Dimensions of the head of the fœtus.*

The head of the fœtus presents five diameters and two circumferences.

#### *Of the five diameters.*

The first extends from the occiput to the chin, and is called the oblique or the occipito-mental diameter. Its extent is four inches and a half.

The second extends from the occiput to the forehead, and is called the occipito-frontal. Its extent is four inches and a quarter.

The third extends from one parietal protuberance to the other, and measures three inches and a half.

The fourth extends from the vertex of the head to the base of the cranium, and measures three inches and a half.

The fifth extends from one mastoid process to the other, and measures from two and a half to three inches.

#### *Of the two circumferences.*

The first divides the head perpendicularly into two lateral hemispheres, and has an extent of from fourteen to fifteen inches.

The second divides the head perpendicularly into two halves, an anterior and a posterior. The extent of this circumference is from ten to eleven inches.

The head of the fœtus is composed of two distinct parts, one of which is superior and is called

the vault of the cranium, and the other, which is inferior, is termed its base.

The vault of the cranium is formed of osseous pieces, which are separated from each other by membranous intervals, some of which are denominated fontanelles, the others sutures. This disposition causes the vault of the cranium, when compressed, to diminish in volume by the approximation or overlapping of the different bones of which it is composed.

The base of the cranium is irreducible.

### *Motions of the head upon the trunk.*

The head of the foetus may be flexed upon the superior part of the thorax, turned backwards, or inclined to either side. It may also perform a small degree of rotary motion.

### OF THE SHOULDERS OF THE FŒTUS.

The shoulders of the foetus, considered in an obstetric point of view, are only interesting as far as regards their volume.

Measured transversely, they present a diameter of four inches and a half; but a considerable allowance should be made for their structure; for it may be remarked, that by simple pressure, the extent of this diameter may be diminished one inch.

### BREECH OF THE FŒTUS.

The breech of the foetus, like the shoulders, is only interesting in respect to its dimensions, though its volume, should it even be double, never presents

any real obstacle to the termination of the labour. It is composed of fourteen osseous pieces which are separated by cartilages, whose approximation may considerably facilitate the delivery.

From the preceding observations, we may draw the following conclusions:

1. From the comparison of the diameters of the pelvis of the mother with those of the principal parts of the foetus; 2, from the different directions of the axes of the pelvis of the mother, and 3, from the difference of the length between the anterior and posterior parietes.

1. The greatest diameters of the foetus exceed the smallest diameters of the pelvis of the mother; but the greatest diameters of the latter exceed the greatest diameters of the foetus; whence we ought to conclude, that, in order that the labour may terminate naturally, it is indispensable that the greatest diameters of the foetus should always correspond to the greatest diameters of the pelvis of the mother.

2. The longest diameters of the superior strait are the oblique, while in the inferior strait, the antero-posterior is the longest. From this it follows, that the largest parts of the foetus, being situated obliquely in the superior strait, must perform a rotary motion in order to be placed in a proper situation in the inferior strait.

3. The three axes of the pelvis represent a kind of curved line whose concavity corresponds to the pubis, and the convexity to the sacrum, and the foetus, in its progress, must necessarily follow this direction.

4. The posterior paries of the small pelvis, has an extent of five inches, while the anterior paries



is only eighteen lines long. This difference of length explains, why, in presentations of the vertex, where the occiput always passes out first, the first two presentations are much more favourable than the last two; for, in the first case, the occiput, in order to pass out, has to traverse an extent of only eighteen lines, while, in the second, it is obliged to follow an extent of nearly five inches.

#### OF THE MECHANISM OF NATURAL LABOUR.

In natural labour, the foetus may present the head, the feet, the knees, or the breech.

#### OF THE PRESENTATIONS OF THE HEAD.

There are four presentations of the head, which correspond to the oblique diameters of the pelvis.

#### FIRST REPRESENTATION.

*Principal relations.*—The occiput corresponds to the left cotyloid cavity, and the forehead to the right sacro-iliac symphysis. The posterior region of the foetus presents forwards and to the left, and the anterior backwards and to the right. The feet are at the fundus uteri.

*Mechanism.*—Pressed by the contractions of the uterus, the head of the foetus is flexed upon the thorax, and its occipito-mental diameter becomes parallel to the axis of the superior strait. In this manner, it traverses the whole cavity of the pelvis, until it has arrived at the inferior strait, where it encounters the inclined planes, which make it rotate in such a manner, that the occiput becomes placed under the arch of the pubes, and the face in the hollow of the sacrum. As soon as this has taken

place, the greatest diameter of the head is in relation with the greatest diameter of the inferior strait, and nothing more is opposed to the delivery of the part of the foetus, unless it be the resistance of the external genital parts. Being continually pressed by the contractions of the uterus, the head gradually advances, and in such a manner, as to dilate the vulva: after each pain, however, it re-ascends to a greater or less extent into the cavity of the pelvis. Finally, after the parturient efforts have overcome the resistance of the external genital parts, the head is delivered. At this moment, the occiput turns under the arch of the pubes, and the different parts of the face are brought in front of the posterior commissure. As soon as the head is free, it assumes its natural relations with the trunk; the occiput is directed towards the left groin, and the face towards the postero-internal part of the right thigh. In this movement of restitution, there is nothing which should surprise us, since the trunk does not participate in the rotary movement which the head is obliged to make, in order to pass the inferior strait.\*

The shoulders, being situated obliquely in the superior strait, traverse the cavity of the pelvis, and as soon as they have arrived at the inferior strait, they encounter the inclined planes, which impress upon them the same rotary movement as upon the head. The right shoulder is brought under the arch of the pubes, and the left into the hollow of the sacrum. At this moment, the head changes its relations; the face looks directly towards the middle and in-

\* It has been observed, that at this instant the head, instead of assuming the position which it had in the superior strait, sometimes assumes the second position.

ternal part of the right thigh, and the occiput towards the middle and internal part of the left thigh. The shoulder, which is posteriorly, receives all the contractions of the uterus, and soon passes through the vulva, while that which is under the pubes, serves it as a point of support.

As soon as the shoulders are delivered, the rest of the body is expelled with a great degree of rapidity, which is easily explained by the fact, that the rest of the foetus is smaller, and that the passage of the mother has been previously dilated by the more voluminous parts.

#### SECOND PRESENTATION.

*Principal relations.*—The occiput corresponds to the right cotyloid cavity, and the face to the left sacro-iliac symphysis. The posterior region of the foetus presents forwards and to the right, and the anterior backwards and to the left. The feet are at the fundus uteri.

*Mechanism.*—The mechanism of the second presentation is precisely the same as that of the first, with the exception, however, that the rotary motions are performed in an inverse direction.

#### THIRD PRESENTATION.

*Principal relations.*—The occiput corresponds to the right sacro-iliac symphysis, and the forehead to the left cotyloid cavity. The posterior region of the foetus is directed backwards and to the right, and the anterior forwards and to the left. The feet are at the fundus uteri.

*Mechanism.*—In its mechanism, the third pre-



sensation of natural labour differs but little from that of the first, since the same diameters of the foetus correspond to the same diameters of the pelvis of the mother.

As in the first presentation, therefore, the head, while in the superior strait, is flexed upon the thorax, and the occiput is the first part that gets into the cavity of the pelvis. As soon as the head has arrived at the inferior strait, it encounters the inclined planes, which impress upon it a rotary motion, in such a manner that the occiput glides upon the posterior and right lateral plane, in order to gain the hollow of the sacrum, while the face glides upon the anterior and left lateral inclined plane, in order to be placed under the arch of the pubes. In this situation, the occiput, receiving all the contractile impressions of the uterus, traverses the hollow of the sacrum, the os coccygis and the perineum, at the same time that the face ascends into the cavity of the pelvis, and is flexed to the utmost degree upon the thorax. The occiput soon after appears at the vulva, which it gradually dilates; and after each pain, it again mounts up into the cavity of the pelvis. Finally, the resistance of the external genital parts being overcome, the occipital region of the head is delivered by following the axis of the inferior strait; but, as it soon after rests upon the posterior commissure, it is turned backwards, and the different parts of the face are disengaged from below the symphysis pubis.

As soon as the head is free, it assumes its natural relations with the trunk; the occiput corresponds to the posterior and internal part of the right thigh, and the face to the left groin.

The shoulders, being situated obliquely in the

superior strait, traverse the cavity of the pelvis, and after having arrived in the inferior strait, they encounter the inclined planes, which impress upon them a rotary motion. The right shoulder is placed in the hollow of the sacrum, and the left under the arch of the pubes. The head at the same time changes its relations: the face presents directly to the middle part of the left thigh, and the occiput to that of the right thigh.

The shoulder, which is posteriorly, receives the contractile impressions of the uterus, and is the first that is delivered, while that which is under the pubes serves as a fulcrum.

When the shoulders are delivered, the rest of the foetus passes without difficulty.

*Remark.*—This third presentation is sometimes naturally converted into the second, and takes place, when the rotary motion, which is impressed upon the foetus, is properly directed.

#### FOURTH PRESENTATION.

*Principal relations.*—The occiput corresponds to the left sacro-iliac symphysis, and the face to the right cotyloid cavity. The posterior region of the foetus is directed backwards and to the left, and the anterior forwards and to the right. The feet are at the fundus uteri.

*Mechanism.*—The mechanism of the fourth presentation is exactly the same as that of the third, with the exception, that the rotary motions are performed in an inverse direction.

*Remark.*—This presentation may be converted naturally into the first.

## PRESENTATIONS OF THE FEET.

The feet may present in four principal positions, which correspond to the oblique diameters of the pelvis. In these presentations, the foetus is placed in such a manner that the thighs are flexed upon the pelvis, and the legs upon the thighs, while the heels are applied against the breech.

## FIRST PRESENTATION.

*Principal relations.*—The heels correspond to the left cotyloid cavity, and the toes to the right sacro-iliac symphysis. The posterior region of the foetus is directed forwards and to the left, and the anterior backwards and to the right. The head is at the fundus uteri.

*Mechanism.*—Pressed by the contractions of the uterus, the feet pass without difficulty the cavity of the pelvis and the inferior strait. The breech soon arrives at the inclined planes and experiences a rotary motion, by which the left hip is placed under the pubes, and the right in the hollow of the sacrum. (This rotary motion, however, can not take place when the pelvis of the mother has only a certain size, and in this case the breech passes obliquely.) The hip, which is posteriorly, receives all the contractile impressions of the uterus, and passes out first, while that which is superiorly serves as a fulcrum. As soon as the breech has passed, it insensibly assumes the position which it had before its arrival at the inclined planes.

The shoulders are situated obliquely in the superior strait, at the same time that the arms are arrested in such a manner as to mount upon the lateral



parts of the head, and as soon as they have arrived in the inferior strait, they are placed in a direct position, and the one which is posteriorly escapes first.

The head, while in the superior strait, is placed in an oblique direction, and the chin is flexed upon the thorax. No sooner has it arrived in the inferior strait, than it experiences its rotary motion; the face is placed in the hollow of the sacrum, and the occiput under the arch of the pubes.

In this situation the chin traverses all the hollow of the sacrum, the os coccygis, and the perineum, and soon appears at the vulva.

The different points of the face are disengaged anteriorly to the posterior commissure, and the occiput is the only part that remains to escape.

#### SECOND PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the right cotyloid cavity, and the toes to the left sacro-iliac symphysis. The posterior region of the fœtus is directed forwards and to the right, and the anterior backwards and to the left. The head is at the fundus uteri.

*Mechanism.*—The mechanism of the second presentation of the feet is precisely the same as that of the first, except that the rotary motions are performed in an inverse direction.

#### THIRD PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the right sacro-iliac symphysis, and the toes to the left cotyloid cavity. The posterior region of the

fœtus is directed backwards and to the right, and the anterior forwards and to the left. The head is at the fundus uteri.

*Mechanism.*—The mechanism of this third presentation differs but little from that of the first, since the same diameters of the fœtus correspond to the same diameters of the pelvis of the mother.

The feet being pressed by the contractions of the uterus, pass without difficulty the cavity of the pelvis and the inferior strait; and the breech, having reached the inclined planes, assumes a straight position, or else, if the pelvis of the mother be very large, it passes obliquely. The shoulders pass obliquely through the superior strait, and upon their arrival in the inferior, they assume a straight position. The head is situated obliquely in the superior strait, and the chin is flexed upon the thorax; and no sooner has it arrived in the inferior strait than it receives a rotary motion, by which the occiput is placed in the hollow of the sacrum and the face under the arch of the pubes.

In this situation the occiput traverses the hollow of the sacrum, the os coccygis, and the perineum, while the face mounts up into the pelvis. In a short time, however, the neck, resting upon the posterior commissure, is turned backwards, and the face is delivered. The occiput is the last to escape.

*Remark.*—The spiral motion which is impressed upon the breech, upon its arrival in the inferior strait, may be sufficiently strong to convert this presentation into the second. This conversion is favourable to the termination of the labour.

## FOURTH PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the left sacro-iliac symphysis, and the toes to the right cotyloid cavity. The posterior region of the foetus is directed backwards and to the left, and the anterior forwards and to the right. The head is at the fundus uteri.

*Mechanism.*—The same as in the third presentation; except that the rotary motions take place in an inverse direction.

*Remark.*—This fourth presentation may be converted naturally into the first.

## PRESENTATIONS OF THE KNEES.

The knees, like the feet, may present in four principal positions which correspond to the oblique diameters of the pelvis. The foetus is disposed in such a manner, that the legs are flexed upon the thighs, while these are extended upon the pelvis.

## FIRST PRESENTATION.

*Principal relations.*—The anterior part of the legs corresponds to the left cotyloid cavity, and the anterior part of the thighs to the right sacro-iliac symphysis. The posterior region of the foetus is directed forwards and to the left, and the anterior backwards and to the right.

## SECOND PRESENTATION.

*Principal relations.*—The anterior part of the legs corresponds to the right cotyloid cavity, and the anterior part of the thighs to the left sacro-iliac



symphysis. The posterior region of the fœtus presents forwards and to the right, and the anterior backwards and to the left.

### THIRD PRESENTATION.

*Principal relations.*—The anterior part of the legs corresponds to the right sacro-iliac symphysis, and the anterior part of the thighs to the left cotyloid cavity. The posterior region of the fœtus looks backwards and to the right, and the anterior forwards and to the left.

### FOURTH PRESENTATION.

*Principal relations.*—The anterior part of the legs corresponds to the left sacro-iliac symphysis, and the anterior part of the thighs to the right cotyloid cavity. The posterior region of the fœtus presents backwards and to the left, and the anterior forwards and to the right.

### MECHANISM OF THE FOUR PRESENTATIONS OF THE KNEES.

The mechanism of the four natural presentations of the knees, is precisely the same as that of the corresponding presentations of the feet, except that the knees present first.

### PRESENTATIONS OF THE BREECH.

The breech, like the feet and the knees, has four presentations. The fœtus is disposed in such a manner that the thighs and the legs are raised and applied against the anterior surface of the trunk.

## FIRST PRESENTATION.

*Principal relations.*—The posterior part of the sacrum corresponds to the left cotyloid cavity, and the posterior part of the thighs to the right sacro-iliac symphysis. The posterior region of the fœtus is directed forwards and to the left, and the anterior backwards and to the right. The head is at the fundus uteri.

## SECOND PRESENTATION.

*Principal relations.*—The posterior part of the sacrum corresponds to the right cotyloid cavity, and the posterior part of the thighs to the left sacro-iliac symphysis. The posterior region of the fœtus is directed forwards and to the right, and the anterior backwards and to the left. The head is at the fundus uteri.

## THIRD PRESENTATION.

*Principal relations.*—The posterior part of the sacrum corresponds to the right sacro-iliac symphysis, and the posterior part of the thighs to the left cotyloid cavity. The posterior region of the fœtus is directed backwards and to the right, and the anterior forwards and to the left. The head is at the fundus uteri.

## FOURTH PRESENTATION.

*Principal relations.*—The posterior part of the sacrum corresponds to the left sacro-iliac symphysis, and the posterior part of the thighs to the right cotyloid cavity. The posterior region of the fœtus

is directed backwards and to the left, and the anterior forwards and to the right. The head is at the fundus uteri.

#### MECHANISM OF THE FOUR PRESENTATIONS OF THE BREECH.

The breech, being situated obliquely in the superior strait of the pelvis, gradually passes into the inferior, where it receives a rotary motion, by means of which, one of the hips is placed in the hollow of the sacrum, and the other under the arch of the pubes. The hip, which is posteriorly, is the one that is first disengaged, while that, which is under the pubes, serves it as a point of support. The trunk passes without difficulty, though the inferior extremities are flexed upon its anterior regions. The axillæ present obliquely in the superior strait; the arms are raised against the sides of the head, and the rest of the delivery terminates precisely in the same manner as in the corresponding presentations of the feet.

## PART II.

OF THE MANAGEMENT OF PRETERNATURAL  
LABOURS.

## SECTION I.

OF THE LABOURS WHICH TERMINATE BY MERE  
MANUAL ASSISTANCE.

*General causes which should induce us to act.*

*On the part of the mother.*—Inertia of the uterus, hemorrhage, convulsions, prostration of strength, syncope, great obliquity of the uterus, an aneurism, a strangulated hernia, &c.

*On the part of the infant.*—The escape of the umbilical cord, its shortness or twisting around the foetus, and the presence of several infants in the uterus, &c.

*Position of the woman.*—The woman should be placed on her back with the breech elevated and well covered; and the thighs and legs should be demi-flexed and properly separated. Assistants are directed to keep her in this position.

*Rules for introducing the hand.*—The hand should be well lubricated with some oleaginous substance, which renders the introduction less painful and protects the accoucheur against the virus with which the parts of the woman may be infected.

The hand should present the least possible volume, and, in order to effect this object, the thumb and fingers



should be united in such a manner as to form a kind of cone, the apex of which shall correspond to the extremities of the fingers.

In introducing the hand, it should be strongly pronated; but in proportion as it enters the parts, it must be brought to a state of supination, so as to follow the direction of the two axes of the pelvis.

The accoucheur should introduce the hand into the vagina during a labour pain, and when this has gone off, he should penetrate the os tincae.

In endeavouring to enter the os tincae, the fundus uteri should be steadied by the other hand, which is to be placed upon the abdomen. In this manner the woman is spared from much unnecessary pain.

#### PRESENTATIONS OF THE FEET.

The feet present in four principal positions, which correspond to the oblique diameters of the pelvis. We have given a detailed account of them in the article on natural labour.

The foetus may be delivered in any one of these four presentations; but as the termination in the first and second is more favourable, and as the foetus may always be brought to these two presentations, we should never neglect doing so.

*Characteristic marks of the feet.*—The articulation of the foot with the leg at a right angle, the heels, the small length of the toes, the convexity of the dorsal region, the inverse disposition of the plantar, and the projection of the maleoli, are the marks by which we may always readily distinguish the feet.

*General rules for introducing the hand.*—The

hand should always be preferred that corresponds naturally to the heels.

Or rather, when the heels present to the left of the pelvis, the right hand should be introduced, and when to the right, the left hand.

When they present to the pubis or sacrum, either hand may be introduced; and when the proper choice has been made, the hand that is introduced must decide the position in which the labour is to be accomplished.

#### FIRST PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the left cotyloid cavity, and the toes to the right sacro-iliac symphysis.

*Characteristic signs of the presentation.*—The simple direction of the feet is sufficient to indicate the position in which they are presented. Thus, in the first presentation, the plantar face is extended obliquely in the direction of a line, which, commencing at the left cotyloid cavity, terminates at the right sacro-iliac symphysis. The heels are anteriorly and the toes posteriorly.

*Management.*—It is the same in the two straits of the pelvis.

The accoucheur grasps the feet behind, and places his index finger between them. If one foot only presents, he should search for the other, so that he may extract both at the same time.

When the feet are delivered, he should be convinced that they belong to the same infant; and having satisfied himself of this, he wraps them in a piece of cloth in order to prevent his fingers from slipping. He now grasps the left limb with the

left hand, and the right with the right hand, taking care to place the thumbs upon the posterior part of the legs and the fingers upon the anterior part: in this manner the limbs are kept in contact, and afford a mutual support. The legs and the thighs must be delivered in succession by pulling them in the direction of the axis of the superior strait, and the cloth and the hands must be moved in proportion.

When the breech has arrived in the inferior strait, the accoucheur must raise it, in order to disengage the hip which is posteriorly; and this being done, he passes the right hand beneath the thighs of the foetus, to raise it a little towards the left groin. He now passes the index and middle fingers of his left hand along the belly of the infant, to assure himself of the safety of the cord. If this has been stretched, it should be relaxed by pulling at the portion which is attached to the placenta, and if it is placed between the two thighs, the upper one ought to be flexed, so that it may be relaxed, and, if possible, brought back to its proper place.

If the cord can not be relaxed, the accoucheur should divide it and terminate the labour.

After the cord has been secured, the accoucheur applies his left hand upon the left hip, and his right upon the right hip, and alternately elevates and depresses the foetus in the direction of a line, which, commencing at the right groin, terminates at the posterior and internal part of the left thigh. In this manner he removes the trunk as far as the axillæ; and when these appear at the vulva, the accoucheur elevates the foetus towards the right groin, and holds it firmly with his left hand, in order to extract the right arm, which he accomplishes in the

following manner:—He begins by introducing the thumb of the right hand into the anterior commissure of the vulva, and carries it to the posterior part of the shoulder; then, introducing the index and middle fingers of the same hand into the posterior commissure and carrying them in front of the articulation, he pulls it in a direction parallel to the axis of the trunk. By passing the index and middle fingers afterwards to the back part of the arm, and the thumb into the axilla, he causes the limb to traverse the hollow of the sacrum, and disengages it from the opposite side, by flexing the forearm upon the arm and by traversing successively every part as far as the extremities of the fingers. At this moment, it is proper to incline the fœtus to the left of the woman, in order that the delivery of the arm may be more easily effected.

The right extremity being delivered, it is to be placed against the corresponding side of the trunk, while the fœtus, being supported on the right hand, is depressed towards the posterior and internal part of the left thigh of the mother, by pressing upon the left hip. This being done, the accoucheur depresses the limb that remains to be disengaged, by grasping it between the index finger which is carried behind, and the thumb which is placed in the axilla; then, without leaving his hold, he depresses the index finger as far as possible, and makes the limb, which is disengaged in the same manner as the preceding, traverse the hollow of the sacrum.

The two superior extremities being delivered, the accoucheur introduces his right hand as far as the face of the fœtus, and places two fingers on each side of its nose, at the same time that he carries the index and middle fingers of the left hand along the back



of the infant as far as the occiput; then, drawing it with the hand placed upon the face, at the same time that he pushes it, with the two fingers placed on the occiput, he thus flexes the head upon the chest. Then, without deranging his hands, he pulls the head of the fœtus into the inferior strait, following the direction of the superior strait. He now places the index and middle fingers of the left hand transversely upon the mastoid process of the right side, and the same fingers of the right hand transversely upon the left side of the chin, and rotates the head; then, elevating and moving it from side to side, in order to direct it in the direction of the axis of the inferior strait, he disengages it. Just as the fœtus is upon the point of issuing, the accoucheur carries his left hand in front of the perineum and below the head, and supports these two parts. He glides at the same time his right hand upon the breech of the fœtus, and, when the delivery is completed, he places it across the genital parts.

#### SECOND PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the right cotyloid cavity, and the toes to the left sacro-iliac symphysis.

*Characteristic signs of the presentation.*—The soles of the feet present obliquely in the direction of a line, which, commencing at the right cotyloid cavity, terminates at the left sacro-iliac symphysis. The heels are anteriorly, and the toes posteriorly.

*Extraction of the fœtus.*—In the second presentation, we must proceed precisely in the same manner as in the first, with this exception, that every thing is done in an inverse order.

Thus, the accoucheur seizes the two feet with the

left hand, and draws them out of the vulva, and this being done, he wraps them in a piece of cloth, and grasps the left limb with the left hand, and the right with the right hand. When the breech is about to pass, the foetus should be raised, in order to disengage the posterior hip. The left hand is now to be passed in front of the thighs, so that the foetus may be raised towards the right groin; then, with the index and middle fingers of the right hand, he should ascertain the situation of the umbilical cord. This done, the accoucheur carries his right hand upon the right hip, and the left upon the left hip, and alternately elevates and depresses the trunk, in the direction of a line, which, commencing at the left groin, terminates at the postero-internal part of the right thigh: these motions should be continued until the axillæ have arrived at the vulva. Then, securing the foetus upon the right hand, and keeping it elevated towards the left groin, he should proceed to deliver the other limb. Supporting the foetus upon his left hand, and depressing it towards the postero-internal part of the right thigh, he disengages the superior limb; then, gliding the left hand upon the face, and the first two fingers of the right hand upon the occiput, he flexes the head, and brings it into the inferior strait. This being done, he places the first two fingers of the right hand across the left mastoid process, and the same fingers of the left hand upon the right side of the chin, and rotates the head; and then by elevating and moving it laterally, he disengages it. When the head is about to escape, he should carry the right hand in front of the perineum, and the left upon the breech; and when the delivery is accomplished, he should lay the infant across the parts of generation.

## THIRD PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the right sacro-iliac symphysis, and the toes to the left cotyloid cavity.

*Characteristic signs of the presentation.*—The soles of the feet present in the direction of a line, which, commencing at the right sacro-iliac symphysis, terminates at the left cotyloid cavity. The heels are posteriorly, and the toes anteriorly.

*Management.*—The management of this presentation, is precisely the same as that of the preceding, with the exception, however, that, in proportion as the fœtus advances, it ought to be brought to the second presentation.

*Remark.*—If the accoucheur arrives, after a part of the trunk has already been delivered, he should apply his right hand upon the belly of the fœtus, and the left upon the back, and should proceed in such a manner as to bring the infant to the second presentation.

## FOURTH PRESENTATION OF THE FEET.

*Principal relations.*—The heels correspond to the left sacro-iliac symphysis, and the toes to the right cotyloid cavity.

*Characteristic signs of the presentation.*—The direction of the soles of the feet is obliquely from behind forwards, and from left to right.

*Management.*—The accoucheur grasps the feet with his right hand, and draws them out; and this being accomplished, he grasps the right foot with the right hand, and the left with the left hand, and

in proportion as the parts advance, he reduces them to the first presentation.

*Remark.*—If the trunk has already been, in part, delivered, the accoucheur should place his left hand upon the abdomen of the child, and the right upon the back; the presentation should be remedied, and in proportion as the child advances, it should be reduced to the first.

I. The heels may correspond directly to either side of the pelvis, as has been admitted by Baudelocque. In these presentations, we should conform to the general rules for introducing the hand. If the heels be to the right of the pelvis, it is necessary to introduce the left hand and to bring them to the second presentation; but if they present to the left, we should introduce the right hand and reduce them to the first presentation.

II. In the presentations where the heels correspond to the pubis or the sacrum, either hand may be introduced; but then the one that is used is to decide the position in which the labour is to be completed. By introducing the right hand, the heels may be brought to the left of the pelvis, so as to be converted into the first presentation; but if the left hand be introduced, the heels must be brought to the right of the pelvis, and be converted into the second presentation.

*Remark.*—In these preternatural presentations, where the trunk is already, in part, delivered, we must endeavour to push it up by placing one hand under the belly and the other upon the back, so as to bring the foetus to a diagonal position in proportion as it advances.

In case the whole trunk has passed the neck of the uterus, and the head alone remains in the supe-



rior strait, it will be impracticable to push it up. The arms, therefore, should be extracted as in ordinary cases, provided the anterior region of the fœtus presents towards the sacrum; but, should this not be the case, they must be brought under the arch of the pubes. This being done, the head should be turned in a diagonal position, by placing two fingers upon the mastoid process of one side, and two others upon the opposite side of the chin. The head should now be brought down into the inferior strait, and the rest of the labour must be conducted in the same manner as in the corresponding presentations of the feet.

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RECAPITULATION OF THE DIFFERENT MANagements APPLICABLE TO THE PRESENTATIONS OF THE FEET.

I. In the first and fourth presentations, and in that where the heels correspond directly to the left side of the pelvis, the management is precisely the same. In fact, the heels being always to the left, the accoucheur should invariably use the right hand, and terminate the labour by the first presentation.

II. In the second and third presentations, and in that where the heels correspond directly to the right side of the pelvis, the management is precisely the same: indeed, we should always use the left hand and deliver by the second presentation.

III. When the heels correspond to the sacrum or the pubis, either hand may be introduced.

The feet should always be grasped from behind, and the index finger placed between them. In every

presentation we should grasp the feet as soon as they are delivered, the right with the right hand, and the left with the left hand; and the posterior limb should always be delivered first.

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#### PRESENTATIONS OF THE KNEES.

The knees, like the feet, present in the superior and inferior straits, in four principal positions which correspond to the oblique diameters of the pelvis. These positions have already been pointed out in speaking of the mechanism of natural labour.

*Characteristic marks of the knees.*—The knees present under the form of two rounded tumours, which are hard and much larger than the elbows, the only parts with which they can be confounded. These two tumours are usually placed beside each other. If there be any doubt, however, the fingers should be introduced farther up, and the examination of the neighbouring parts will soon convince us of the diagnosis.

As the management is not the same in both straits, we shall speak first with regard to that of the inferior strait.

#### PRESENTATIONS OF THE KNEES AT THE INFERIOR STRAIT.

The knees, when in the inferior strait, may be extracted, 1st, with the aid of the fingers placed in the popliteal fold; 2d, with the aid of a blunt hook, and 3d, by means of a fillet.

The application of the fingers alone is seldom sufficient.

The blunt hook is more convenient, but it terrifies the woman, and should, therefore, be avoided.

The fillet answers the purpose of the blunt hook, and is not attended with the same inconveniences.

*General rules in relation to the fillet.*—In the first and fourth presentations, the fillet should be placed in the right hand, and in the second and third, in the left hand.

The fillet should be applied to the popliteal fold of the anterior leg; or, if the hams be directed the one to the right and the other to the left, either hand may be introduced, and one only is necessary for its application.

When the fillet is fixed, it represents the extremity which it embraces, and should always be grasped with the hand that corresponds to that extremity by name.

#### FIRST PRESENTATION OF THE KNEES AT THE INFERIOR STRAIT.

*Principal relations.*—The anterior part of the legs corresponds to the left cotyloid cavity, and that of the thighs to the right sacro-iliac symphysis.

*Management.*—The accoucheur fixes the fillet upon the apex of the right index finger, and carries it from above downwards in the fold of the ham which is superiorly, draws it, with the thumb and index finger of the same hand, between the two knees, and forms its extremities into two, nearly equal, heads. These heads should be firmly secured in the palm of the left hand by the last three fingers, while the index finger is extended upon the external part of the thigh which is above. The index finger of

the opposite hand should be carried upon the external side of the limb which is below.

The knees are to be brought down, in the direction of the axis of the superior strait, as soon as they are sufficiently disengaged to be grasped by the hand. The fillet is now to be removed, and the thumbs are placed upon the anterior part of the legs, and the fingers upon the anterior part of the thighs. As soon as the breech appears at the vulva, the foetus is to be elevated, in order to disengage the posterior hip; and the feet, being afterwards brought under the arch of the pubes, are delivered by flexing the thighs upon the pelvis.

When the feet are delivered, the labour is to be finished as in the first presentation of the feet.

#### SECOND PRESENTATION OF THE KNEES AT THE INFERIOR STRAIT.

*Principal relations.*—The anterior part of the legs corresponds to the right cotyloid cavity, and the anterior part of the thighs to the left sacro-iliac symphysis.

*Management.*—The fillet is to be introduced with the left and grasped by the right hand, and the index finger of the other hand should be placed along the inferior limb. The delivery of the knees is afterwards effected in the manner already pointed out. When the feet are disengaged, the presentation is to be converted into the second presentation of the feet.



## THIRD PRESENTATION OF THE KNEES AT THE INFERIOR STRAIT.

*Principal relations.*—The anterior part of the legs corresponds to the right sacro-iliac symphysis, and the anterior part of the thighs to the left cotyloid cavity.

*Management.*—The fillet is to be introduced with the left hand, and, as it embraces the right ham, it must be grasped with the right hand. The left index finger is placed behind, and the delivery of the knees is to be conducted in such a manner that they may be brought to the second presentation. When the feet are disengaged, the labour is to be accomplished in the same manner as in the second presentation of the feet.

## FOURTH PRESENTATION OF THE KNEES AT THE INFERIOR STRAIT.

*Principal relations.*—The anterior part of the legs corresponds to the left sacro-iliac symphysis, and the anterior part of the thighs to the right cotyloid cavity.

*Management.*—The fillet is introduced with the right hand, and as it embraces the left ham, it must be grasped with the left hand. The index finger of the right hand is extended upon the posterior limb, and the knees are drawn down and brought to the second presentation. When the feet are delivered, the labour is to be conducted as in the first presentation of the feet.

1. When the anterior part of the legs corresponds directly to the left side of the pelvis, the accoucheur must introduce the fillet with the right hand,

grasp it with the left, and convert the presentation into the first.

2. When the anterior part of the legs corresponds directly to the right side of the pelvis, the accoucheur is obliged to introduce the fillet with the left hand, grasp it with the right, and convert the presentation into the second.

3. When the anterior part of the legs corresponds directly to the pubis or the sacrum, the accoucheur may introduce the fillet with either hand, and convert the presentation into the first or second.

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#### RECAPITULATION OF THE DIFFERENT MANAGERMENTS APPLICABLE TO THE PRESENTATIONS OF THE KNEES AT THE INFERIOR STRAIT.

1. In the first and fourth presentations, and in that where the anterior part of the legs corresponds to the left side of the pelvis, the management is the same; for in all these presentations, the accoucheur introduces the fillet with the right hand, grasps it with the left, and finishes the labour by the first presentation.

2. In the second and third presentations, and in that where the anterior part of the legs corresponds directly to the right side of the pelvis, the management is precisely similar; for in all these presentations, the accoucheur introduces the fillet with the left hand, grasps it with the right, and converts the presentations into the second.

3. In the presentations where the anterior part of the legs corresponds to the pubis or the sacrum, the fillet is introduced with either hand, and the foetus is brought to the first or second presentation.

## PRESENTATIONS OF THE KNEES AT THE SUPERIOR STRAIT.

In these presentations, it is preferable to bring down each foot separately, and to accomplish the delivery as in the presentations of the feet.

*Choice of the hand.*—When the feet are to the left of the pelvis, the accoucheur introduces the right hand.

When they present to the right, he introduces the left hand.

When they present to the pubis or the sacrum, he may use either hand.

*Rules for delivering the Feet.*

The accoucheur should always first examine the member which is behind, but he should extract that first which is superiorly.

When the posterior limb is delivered first, it is to be used as a guide in searching for the other; but when this has been extracted first, we must again traverse the limb which is situated behind in order to disengage it.

This general rule being applicable to all cases of delivery of the feet, we shall not again revert to it.

## FIRST PRESENTATION OF THE KNEES AT THE SUPERIOR STRAIT.

*Principal relations.*—The same as at the inferior strait, only that the parts are less engaged.

*Management.*—The accoucheur introduces the right hand as far as the posterior limb, carries it along the thigh to the knee, and from thence along

the leg until he meets the foot, which he grasps between the thumb and the fingers and draws it out.

The first limb being delivered, it should be used as a guide in searching for the other. Passing his hand along its postero-external side, the accoucheur takes care to apply his thumb to the internal part, and carrying it up as far as the breech, where he meets the other extremity, he draws it down by passing his four fingers to its upper part, and by pressing upon the extremity that has been already delivered.

The two extremities being delivered, the labour is finished by bringing the foetus to the first presentation of the feet.

#### SECOND PRESENTATION OF THE KNEES AT THE SUPERIOR STRAIT.

*Principal relations.*—The same as at the inferior strait.

*Management.*—The accoucheur introduces the left hand and brings down the feet precisely in the same manner as in the first presentation; and, as soon as the feet are delivered, he finishes the labour by bringing the child to the second presentation of the feet.

#### THIRD PRESENTATION OF THE KNEES AT THE SUPERIOR STRAIT.

*Principal relations.*—The same as at the inferior strait.

*Management.*—The accoucheur, introducing his left hand, delivers the feet in the same manner as in the second presentation; and as soon as this is accomplished, he will find the presentation converted



into the third presentation of the feet, which must be reduced to the second.

#### FOURTH PRESENTATION OF THE KNEES AT THE SUPERIOR STRAIT.

*Principal relations.*—The same as at the inferior strait.

*Management.*—The accoucheur, introducing the right hand, delivers the extremities, precisely in the same manner as in the first presentation, and this being done, he converts it into the fourth presentation of the feet, and this into the first.

I. When the anterior part of the legs corresponds directly to the left side of the pelvis, the accoucheur introduces the right hand, and delivers the feet in the same manner as in the first and fourth presentations.—The labour is completed by bringing the fœtus to the first presentation of the feet.

II. When it corresponds directly to the right side, the accoucheur introduces the left hand, and proceeds as in the second and third presentations.—The labour is finished by bringing the fœtus to the second presentation of the feet.

III. When the anterior part of the legs corresponds to the sacrum or pubis, the accoucheur may introduce either hand, with this provision, that the one which he uses must determine the position in which the labour is to be completed. Thus, when the right hand is introduced, the accoucheur should turn the feet of the fœtus to the left side of the pelvis, and *vicē versâ*.

RECAPITULATION OF THE DIFFERENT MANAGE-  
MENTS APPLICABLE TO THE PRESENTATIONS  
OF THE KNEES AT THE SUPERIOR STRAIT.

1. In the first and fourth presentations, and in that where the anterior part of the legs corresponds directly to the left side of the pelvis, the management is precisely the same; for in all these presentations, the feet being to the left, the accoucheur must always introduce the right hand, and bring the foetus to the first presentation of the feet.

2. In the second and third presentations, and in that where the anterior part of the legs corresponds directly to the right side of the pelvis, the management is precisely the same. For in all these presentations, the feet being to the right, the accoucheur introduces the left hand, and brings the foetus to the second presentation of the feet.

3. In the presentations where the anterior part of the legs corresponds to the pubis or the sacrum, the accoucheur may introduce either hand, and bring the foetus to a diagonal position, in order to proceed in the same manner as in that presentation.

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PRESENTATIONS OF THE BREECH.

The breech, like the feet and the knees, presents at the superior and inferior straits in four principal positions, which correspond to the oblique diameters of the pelvis. These presentations, having been already pointed out in speaking of the mechanism of natural labour, need not, therefore, be treated of on the present occasion.

*Characteristic marks of the breech.*—The breech may be known by a large rounded tumour, which is softer than the head, and harder than the abdomen, and presents three osseous projections, which are formed by the os coccygis behind, and by the tuberosities of the ischia on either side, and in the middle a deep groove, in which are the anus and the genital organs. The accoucheur may be still farther aided in his diagnosis, by the two columns which are formed by the thighs, and by a discharge of meconium.

The management not being the same in both straits, we shall treat first of the presentations of the inferior strait.

#### PRESENTATIONS OF THE BREECH AT THE INFERIOR STRAIT.

When the breech presents at the inferior strait, it is almost always impossible to push it up into the uterus, and the accoucheur is obliged to extract it in the position in which it presents.

To effect this, the accoucheur may employ his hands, a fillet, or the blunt hooks, which are to be placed in the folds of the groins.

As the blunt hooks generally deserve the preference, we shall point out those presentations which demand the employment of instruments; though, strictly speaking, the breech may be extracted either by means of the fingers alone, or with the aid of a fillet.

*Rules for the application of the fingers, the fillet,  
and the blunt hooks.*

*Fingers.*—If the accoucheur determines on using his fingers, he should invariably place the right index finger in the fold of the right groin, and the left in the fold of the left groin. But as the fingers generally glide upon the parts which they embrace, a sufficiently firm hold can not be obtained for the extraction of the breech.

*Fillet.*—If the accoucheur employs the fillet, he should place it in the fold of the anterior groin. In the first and fourth presentations, it is to be carried there with the index finger of the right hand, and in the second and third, with that of the left hand.

When the fillet is applied, it represents the extremity which it embraces, and should be invariably grasped with the hand that corresponds to that extremity by name.

The introduction of the fillet is attended with much difficulty, and is, therefore, seldom employed in extracting the breech.

*Blunt hooks.*—When two blunt hooks are to be used, they are applied the one in the fold of the anterior groin, and the other in the fold of the posterior; but as a general rule, one is sufficient, and is invariably applied in the fold of the anterior groin. The blunt hook to be used should form a right angle with its handle; so that there may be no danger of its penetrating the thigh, a circumstance which might happen, if the curve of the instrument be too narrow to surround the whole limb.

It is of little importance with which hand the



blunt hook be introduced; though in the first and fourth presentations, it is preferable to use the right, and the left in the second and third.

The index finger of one hand should always be used as a guide to the hook, in order that its introduction may be the more safe and easy.

When the hook is secured, it represents the extremity which it embraces, and should always be grasped with the hand that corresponds to that extremity by name.

#### FIRST PRESENTATION OF THE BREECH AT THE INFERIOR STRAIT.

*Principal relations.*—The posterior face of the sacrum corresponds to the left cotyloid cavity, and that of the thighs to the right sacro-iliac symphysis.

*Characteristic signs of the presentation.*—The point of the os coccygis is behind the left cotyloid cavity, and the genital parts before the right sacro-iliac symphysis. Between these two points are the anus and the perineal raphe, which present in the direction of a line that passes from the left cotyloid cavity to the right sacro-iliac symphysis.

*Management.*—The accoucheur applies the blunt hook in the fold of the left groin, and grasps it with his left hand; and then gliding the index finger of the right hand in the fold of the posterior groin, he pulls the breech in the direction of the axis of the inferior strait; and as soon as the parts have advanced so far as to enable him to use his hands, he removes the instrument. The accoucheur then applies the left hand to the left hip, and the right upon the right hip, and alternately elevates and depresses the trunk in the direction of a line, extending from

the right groin to the postero-internal part of the left thigh. By this management, the feet are soon disengaged, and the rest of the body may be delivered as in the first presentation of the feet.

## SECOND PRESENTATION OF THE BREECH AT THE INFERIOR STRAIT.

*Principal relations.*—The posterior face of the sacrum corresponds to the right cotyloid cavity, and that of the thighs to the left sacro-iliac symphysis.

*Characteristic signs of the presentation.*—The point of the os coccygis is behind the right cotyloid cavity, and the genital parts before the left sacro-iliac symphysis. Between these two parts are the anus and the perineal raphe, which present in the direction of a line, that extends from the right cotyloid cavity to the left sacro-iliac symphysis.

*Management.*—The accoucheur places the blunt hook in the fold of the right groin and holds it with the right hand; then gliding the left index finger in the fold of the left groin, he pulls the breech in the direction of the axis of the inferior strait, and when the parts have advanced sufficiently to enable him to use his hands, he removes the instrument. He now applies his right hand upon the right hip, and the left upon the left hip, and alternately elevates and depresses the trunk in the direction of a line, extending from the left groin to the postero-internal part of the right thigh. The inferior extremities are soon delivered, and the rest of the labour is to be conducted on the same principles as in the second presentation of the feet.

### THIRD PRESENTATION OF THE BREECH AT THE INFERIOR BREECH.

*Principal relations.*—The posterior face of the sacrum corresponds to the right sacro-iliac symphysis, and that of the thighs to the left cotyloid cavity.

*Characteristic signs of the presentation.*—The point of the os coccygis is before the right sacro-iliac symphysis, and the genital parts behind the left cotyloid cavity. Between these two points are the anus and the perineal raphe, which present in the direction of a line, extending from the right sacro-iliac symphysis to the left cotyloid cavity.

*Management.*—The accoucheur introduces the hook in the fold of the right groin, and holds it with the right hand; then passing the index finger of the left hand, in the fold of the left groin, he draws the breech in such a manner as to bring it to the second presentation. In other respects, he proceeds precisely on the same principles as in the second presentation of the breech.

### FOURTH PRESENTATION OF THE BREECH AT THE SUPERIOR STRAIT.

*Principal relations.*—The posterior face of the sacrum corresponds to the left sacro-iliac symphysis, and that of the thighs to the right cotyloid cavity.

*Characteristic signs of the presentation.*—The point of the os coccygis is before the left sacro-iliac symphysis, and the genital parts behind the right cotyloid cavity. Between these two points are the

anus and the perineal raphe, which present in the direction of a line, extending from the left sacro-iliac symphysis to the right cotyloid cavity.

*Management.*—The accoucheur introduces the hook in the fold of the left groin and holds it with the left hand; then gliding the index finger of his right hand in the fold of the right groin, he draws the breech in such a manner as to bring it to the first presentation. The labour is to be completed in the same manner as in the first presentation of the breech.

I. When the posterior face of the sacrum corresponds directly to the left side of the pelvis, and that of the thighs to the right, the presentation will be characterized by the os coccygis being to the left, and the genital parts to the right. The perineal raphe is directed transversely.

*Management.*—Precisely the same as in the first and fourth presentations.

II. When the posterior face of the sacrum corresponds directly to the right side of the pelvis, and that of the thighs to the left, the os coccygis will be to the right, the genital parts to the left, and the perineal raphe transversely.

*Management.*—Precisely the same as in the second and third presentations.

III. When the posterior face of the sacrum corresponds directly to the pubis, and that of the thighs to the sacrum, the presentation will be characterized by the os coccygis being behind the pubis, the genital parts before the sacrum, and the direction of the perineal raphe from before backwards.

*Management.*—The accoucheur may introduce the hook in either groin and convert the presentation into the first or second diagonal, in such a manner as



to leave the limb, which is embraced by the hook, in front. The other steps of the labour are to be conducted as in the first or second diagonal presentation.

IV. When the posterior face of the breech corresponds directly to the sacrum, and that of the thighs to the pubis, the os coccygis will be found before the sacrum, the genital parts behind the pubis, and the perineal raphe directly from before backwards.

*Management.*—The accoucheur places the hook in one of the groins and reduces the presentation to the third or fourth diagonal, in such a manner as always to have the instrument in front.

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RECAPITULATION OF THE DIFFERENT MANagements APPLICABLE TO THE PRESENTATIONS OF THE BREECH AT THE INFERIOR STRAIT.

1. In the first and fourth presentations, and in that where the sacrum corresponds to the left side of the pelvis, the management is precisely the same. In fact, in all these presentations, the accoucheur introduces the hook or fillet in the fold of the left groin, passes the right index finger in the fold of the right groin, and delivers by the first presentation.

2. In the second and third presentations, and in that where the sacrum corresponds to the right side of the pelvis, the management is precisely similar. For in all these presentations, we should place the hook or fillet in the fold of the right groin, pass the index finger of the left hand in the fold of the left groin, and deliver by the second presentation.

When the posterior face of the breech corresponds to the pubes or the sacrum, the accoucheur introduces the hook or fillet in either groin, and brings the fœtus to a diagonal position in order to terminate the labour by the first or second presentation.

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#### PRESENTATIONS OF THE BREECH AT THE SUPERIOR STRAIT.

As long as the breech is in the superior strait, it is always easy to push it up, so as to get at the feet. By this management the presentations of the breech will be converted into those of the feet.

*Indications to be fulfilled before searching for the feet.*

As the breech obstructs the superior strait, and as the feet have not yet descended, it would be impossible, under these circumstances, to introduce the hand, so that we must endeavour by a well directed management, to free the superior strait, and bring down the feet. This double indication is fulfilled by pushing the breech to one of the internal iliac fossæ, and by inclining the uterus to the opposite side.

#### *General Rules for displacing Presentations of the Breech at the Superior Strait.*

Whenever the accoucheur introduces the right hand, he should push the fœtus to the right, and when he introduces the left, he should push it to the left. The uterus should always be inclined to the side opposite to that towards which he pushes.

*Choice of the hand.*—When the feet are to the left of the p  lvis, the accoucheur introduces the right hand, and when they are to the right, he uses the left hand. Whenever they present to the sacrum or the pubis, he may employ either hand.

#### FIRST PRESENTATION OF THE BREECH AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as at the inferior strait, with the exception, that the parts are less engaged.

*Characteristic signs of the presentation.*—The same as at the inferior strait.

*Management.*—The accoucheur, introducing the left hand, places the thumb in front and the fingers behind the breech, and pushes it towards the left iliac fossa, while, with the right hand applied upon the fundus uteri, he inclines this organ to the left; then, passing his hand along the posterior leg until he meets the foot, he grasps it between his thumb and fingers, and brings it down.

When this limb is disengaged, it should be used as a guide in searching for the other, which is generally placed across the anterior part of the abdomen and thorax. The accoucheur passes his hand along the postero-external part, leaves the thumb on the inside, and, upon reaching the anterior region of the trunk, he soon finds the second extremity, which he brings down by passing up his four fingers. When both feet are delivered, the labour is finished as in the first presentation of the feet.

## SECOND PRESENTATION OF THE BREECH AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as at the inferior strait.

*Characteristic signs of the presentation.*—The same as at the inferior strait.

*Management.*—The accoucheur introduces the right hand and pushes the fœtus towards the right iliac fossa, at the same time that he inclines the uterus towards the left, with the other hand placed upon the abdomen. The delivery of the feet is then accomplished upon the same principles as in the first presentation; and, as soon as they are without, the labour is conducted as in the second presentation of the feet.

## THIRD PRESENTATION OF THE BREECH AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as at the inferior strait.

*Characteristic signs of the presentation.*—The same as at the inferior strait.

*Management.*—The accoucheur introduces the right hand, and, pushing as much as possible towards the right iliac fossa, he endeavours to bring the breech to the second presentation. This being done, he inclines the uterus towards the left, and proceeds to deliver the feet in the same manner as in the second presentation. When the feet are disengaged, the labour is to be accomplished as in the second presentation of the feet.



#### FOURTH PRESENTATION OF THE BREECH AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as at the inferior strait.

*Characteristic signs of the presentation.*—The same as at the inferior strait.

*Management.*—The accoucheur introduces the left hand, and, in pushing the breech to the left iliac fossa, he endeavours to convert it, if possible, into the first presentation. At the same time that this is doing, he should incline the uterus towards the right and deliver the feet upon the same principles as in the preceding presentations. This being done, he proceeds as in the first presentation of the feet.

I. When the posterior face of the sacrum corresponds directly to the left side of the pelvis, and the posterior face of the thighs to the right, the presentation will be characterized by the same signs as at the inferior strait; and the labour is to be conducted as in the first and fourth presentations.

II. When it presents directly to the right, the accoucheur proceeds in the same manner as in the second and third presentations.

III. When the posterior face of the sacrum presents directly to the pubes, the accoucheur introduces either hand, and brings the fœtus to the first or second diagonal presentation, in such a manner that the inferior extremities shall correspond to the hand introduced. Thus, if the right hand be introduced, he must push to the right, and to the left, if he introduce the left hand. The labour is then to be conducted upon the same principles as in the diagonal presentation into which it is converted.

IV. When it presents directly to the sacro-vertebral angle, the accoucheur may introduce either hand, and convert the presentation into the third or fourth diagonal; and proceed afterwards in the same manner as we have just pointed out.

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RECAPITULATION OF THE DIFFERENT MANAGEMENTS APPLICABLE TO THE PRESENTATIONS OF THE BREECH AT THE SUPERIOR STRAIT.

1. In the first and fourth presentations, and in that where the sacrum corresponds directly to the left side of the pelvis, the management is precisely similar. In fact, in all these presentations, the feet being directed to the right of the mother, the accoucheur introduces the left hand, pushes the breech towards the left iliac fossa, and inclines the uterus to the right. When the feet are delivered, the labour is conducted as in the first presentation of the feet.

2. In the second and third presentations, and in that where the sacrum corresponds directly to the right of the pelvis, the management is precisely the same. For in all these presentations, the feet being to the left of the mother, the accoucheur must introduce the right hand, push towards the right, incline the uterus to the left, and finish as in the second presentation of the feet.

3. When the breech presents directly to the sacrum or the pubes, the accoucheur may introduce either hand, and convert the presentation into one of the diagonal presentations of the feet.

## PRESENTATIONS OF THE VERTEX OF THE HEAD.

The head, like the feet, the knees and the breech, may present at the superior and inferior straits in four principal positions, which correspond to the oblique diameters of the pelvis. These presentations, having already been pointed out in speaking of the mechanism of natural labour, need not be repeated here.

*Characteristic marks of the head.*—The head presents under the form of a hard, large and rounded tumour, having certain membranous intervals, called fontanelles and sutures. The peculiar characters of the hairy scalp may also serve in pointing out the diagnosis.

The management applicable to the presentations of the head, is not the same in both straits.

When the head is at the inferior strait, whether it has passed the cervix uteri, or not, we should apply the forceps. We shall revert to this series of presentations when speaking of those labours which demand the employment of instruments.

When the head is at the superior strait, it would often be more proper to use the forceps, yet the child may be turned, and the labour terminated by the aid of the hand alone.

## EXTRACTION OF THE FŒTUS WHEN THE VERTEX OF THE HEAD PRESENTS AT THE SUPERIOR STRAIT.

In these cases the aid of the hand can be employed only in turning the fœtus.

*Indications to be fulfilled.*—Previously to his searching for the feet, the accoucheur should free

the superior strait, by pushing the head towards one of the iliac fossæ, and bring down the feet, by inclining the uterus firmly to the opposite side.

*Rules for displacing the Presentations of the Vertex of the Head at the Superior Strait.*

These have been pointed out in speaking of the presentations of the breech at the superior strait.

*Choice of the hand.*—Whenever the accoucheur wishes to get at the feet of the fœtus, he should pass one of his hands along the side of the trunk. The hand, which is introduced, should invariably correspond by name to the side along which it is directed. In the diagonal presentations, this side is always directed backwards.

In the direct presentations, the lateral regions of the fœtus correspond directly, the one to the right, and the other to the left; so that either hand may be introduced.

FIRST PRESENTATION OF THE VERTEX OF THE HEAD  
AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the left cotyloid cavity, and the forehead to the right sacro-iliac symphysis. The left side is behind, and the right anteriorly. The feet are at the fundus uteri.

*Characteristic signs of the presentation.*—The posterior fontanelle is behind the left cotyloid cavity, and the anterior before the right sacro-iliac symphysis. Between these two fontanelles, is the sagittal suture, which presents in the direction of a



line, extending from the left cotyloid cavity to the right sacro-iliac symphysis.

*Management.*—The left side of the fœtus being behind, the accoucheur introduces the left hand, and applying his thumb upon the forehead, and his fingers upon the posterior part of the head, he pushes it towards the left iliac fossa, at the same time that he inclines the uterus firmly towards the right, by placing his right hand upon the abdomen of the mother. Then passing down his hand as far as possible, he directs it successively along the side of the head, the neck, the shoulder, the side properly so called, and the hip, until he arrives at the breech, where he will generally find the feet, which may be brought down together, though it will be better to deliver them separately. In order to effect this, the accoucheur glides his hand down the thigh as far as the knee, and then up along the leg until he finds the foot, which he grasps between his thumb and fingers and brings it down. When one of the feet is delivered, it should be secured by means of a noose, which is to be applied above the maleoli and given to an assistant.

The accoucheur now passes his hand along the external and posterior part of the extremity that has been delivered, until he reaches the breech, where he finds the second foot, which he brings down by passing up his four fingers.

After the two extremities have been delivered, the labour is to be conducted as in the second presentation of the feet.

It sometimes happens, that the head is arched against the superior strait, so as to impede the extraction of the fœtus. Under these circumstances,

we should push it up with the right hand, at the same time that we pull at the feet.

## SECOND PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the right cotyloid cavity, and the forehead to the left sacro-iliac symphysis. The right side of the fœtus is behind, the left in front, and the feet at the fundus uteri.

*Characteristic signs of the presentation.*—The posterior fontanelle is behind the right cotyloid cavity, and the anterior before the left sacro-iliac symphysis. The sagittal suture presents obliquely in the direction of a line, extending from the right cotyloid cavity to the left sacro-iliac symphysis.

*Management.*—Precisely the same as in the first presentation, with the exception, that instead of the left, we should employ the right hand.

Thus, the accoucheur pushes the head towards the right iliac fossa, inclines the uterus to the left, passes his hand along the posterior side of the fœtus, and brings down the feet separately. When the extremities are delivered, the labour is to be finished as in the first presentation of the feet.

Should the head impede the extraction of the fœtus, the accoucheur must push it up with the left hand, at the same time that he draws down the feet with the right.

### THIRD PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the right sacro-iliac symphysis, and the forehead to the left cotyloid cavity. The right side of the foetus is behind, the left in front, and the feet at the fundus uteri.

*Characteristic signs of the presentation.*—The posterior fontanelle is before the right sacro-iliac symphysis, and the anterior behind the left cotyloid cavity. The sagittal suture presents obliquely in the direction of a line, extending from the right sacro-iliac symphysis to the left cotyloid cavity.

*Management.*—Precisely the same as in the second presentation.

### FOURTH PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the left sacro-iliac symphysis, and the forehead to the right cotyloid cavity. The left side of the foetus is behind, the right in front, and the feet at the fundus uteri.

*Characteristic signs of the presentation.*—The posterior fontanelle is before the left sacro-iliac symphysis, and the anterior behind the right cotyloid cavity. The sagittal suture presents in the direction of a line, extending from the left sacro-iliac symphysis to the right cotyloid cavity.

*Management.*—Precisely the same as in the first presentation.

I. When the occiput presents directly to the left

side of the pelvis, and the forehead to the right, the presentation will be characterized by the posterior fontanelle being to the left, the anterior to the right, and the sagittal suture transversely.

*Management.*—Precisely the same as in the first and fourth presentations.

II. When the occiput corresponds directly to the right side of the pelvis, and the forehead to the left, the presentation will be characterized by the posterior fontanelle being to the right, and the anterior to the left. The sagittal suture will be situated transversely.

*Management.*—The accoucheur proceeds precisely in the same manner as in the second and third presentations.

III. When the occiput presents directly to the symphysis pubis, and the forehead to the sacrum, the presentation will be characterized by the posterior fontanelle being behind the symphysis pubis, and the anterior before the sacro-vertebral angle. The sagittal suture will present directly from before backwards.

*Management.*—The accoucheur introduces either hand, and converts the presentation into the first or second diagonal, in such a manner as to direct the side of the foetus, which corresponds by name to the hand which is introduced, backwards. The rest of the labour is conducted upon the same principles as in the first or second diagonal presentation.

IV. When the occiput corresponds directly to the sacrum, and the forehead to the symphysis pubis, the posterior fontanelle will be before the sacro-vertebral angle, and the anterior behind the symphysis pubis. The sagittal suture will be directed as in the preceding presentation.



*Management.*—The accoucheur introduces either hand, and converts the presentation into the third or fourth diagonal, and always in such a manner as to direct the side of the fœtus, which corresponds by name to the hand that is introduced, backwards. The rest of the labour is conducted as in the presentation into which it is converted.

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RECAPITULATION OF THE DIFFERENT MAN-  
AGEMENTS APPLICABLE TO THE PRESENTATIONS OF  
THE VERTEX OF THE HEAD AT THE SUPERIOR  
STRAIT OF THE PELVIS.

1. In the first and fourth presentations, and in that where the occiput corresponds directly to the left side of the pelvis, the management is precisely the same. In fact, in all these presentations, the left side of the fœtus being behind, the accoucheur must introduce the left hand, push the head towards the left iliac fossa, incline the uterus towards the right, and deliver by the second foot presentation.

2. In the second and third presentations, and in that where the occiput corresponds directly to the right of the pelvis, the management is precisely similar. For in all these presentations, the right side of the fœtus being behind, the accoucheur must introduce the right hand, push the head towards the right, incline the uterus to the left, and deliver by the first foot presentation.

3. In those presentations where the occiput presents to the pubes or the sacrum, the accoucheur introduces either hand, and converts the presentation into one of the diagonal presentations, in order to proceed afterwards as in these presentations.

## PRESENTATIONS OF THE TRUNK.

Before speaking of the presentations of the trunk, it would be natural to study those of the face and of the occipital and temporal regions, but as these different presentations of the head present nothing peculiar, and as they may be confounded with those of the trunk, it appears to be more simple and proper to arrange them all under one head. Thus, we shall include in the regions of the trunk, the face properly so called, and the occipital and temporal regions.

The trunk of the fœtus comprehends four grand regions, an anterior, a posterior and two lateral.

If we were to study the management that is applicable only to each of these regions of the fœtus, we might dispense with subdividing them into several other secondary regions; but in order to point out with more precision the distinguishing characters of the different parts of the same region, we shall retain the subdivisions that have been admitted by most authors. But, when treating of the management, we shall consider the grand regions of the fœtus as one and the same part, which in presenting at the superior strait of the pelvis, obliges the accoucheur to fulfil the following indications.

*First indication.*—If the bad presentation of the fœtus be the only obstacle to the natural termination of the labour, we must confine our whole management to replacing it in a proper position, that is, to bringing its nearest extremity to the centre of the superior strait of the pelvis.

*Management.*—When this extremity is to the left of the pelvis, the accoucheur introduces the

right hand, pushes to the right of the mother and inclines the uterus to the left. If, on the contrary, it be to the right, he introduces the left hand, pushes to the left, and inclines the uterus to the right.

As soon as the child is properly replaced, nature will accomplish the rest of the labour.

*Second indication.*—It sometimes happens that preternatural presentations are complicated with inertia of the uterus, hemorrhage, convulsions, &c. Under these circumstances it is not merely necessary to place the foetus in a proper position, but the labour should be terminated as soon as possible by bringing down the feet.\*

*Management.*—The accoucheur introduces the hand, which corresponds to the side of the foetus, along which he is desirous to pass it. In the presentations of the anterior and posterior regions, this side is behind; and below, in the presentations of the lateral regions. The accoucheur pushes to the side of the mother, which corresponds, by name, to the hand that is introduced; brings the parts of the foetus close together, and carries his hand along the side which we have just indicated, until he meets the feet, which he brings down in the manner already pointed out. (v. page 38.)

#### POSTERIOR REGION OF THE TRUNK.

The posterior region of the trunk comprehends the occipital region of the head, the neck, the back and the loins.

\* If the head be found very near the superior strait, it would, perhaps, be more easy to bring it to the centre of the pelvis, and to apply the forceps.

## CHARACTERISTIC MARKS OF EACH OF THESE PARTS.

*Occipital region.*—This region may be known by the posterior fontanelle, the lambdoïdal suture, the tubercle of the os occipitis, and by the neighbourhood of the posterior part of the neck.

*The neck.*—This region may be recognised by the projection of the spinous processes of the cervical vertebræ, the small size of the neck, compared with that of the head, and by the shoulders.

*The back.*—The back is characterized by the presence of the scapulæ, by the spinous processes of the dorsal vertebræ, by the ribs and intercostal spaces.

*The loins.*—The loins are characterized by the spinous processes of the lumbar vertebræ, by the want of resistance on each side of the vertebral column, by the presence of the last rib superiorly, and by that of the bones of the pelvis inferiorly.

*Presentations.*—The posterior region of the trunk may present in four principal directions which correspond to the oblique diameters of the pelvis.

## FIRST PRESENTATION OF THE POSTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head corresponds to the left cotyloid cavity, and the breech to the right sacro-iliac symphysis. The back is directed downwards, the belly upwards, the right side backwards and to the left, and the left side forwards and to the right.

*Characteristic signs of the presentation.*—The direction of the spinous processes of the vertebræ,



will, in itself, be sufficient to enable us to distinguish this presentation; especially, if we remember the different characters which belong to each region in particular. Thus, in the first presentation, we shall find, in front and to the left, the peculiar characters of the superior parts of the foetus, and behind and to the right, those which belong to its inferior parts. The spinous processes present obliquely in the direction of a line extending from the left cotyloid cavity to the right sacro-iliac symphysis.

*Management.*—When the head is to the left of the pelvis, near the superior strait, the accoucheur introduces the right hand, and by placing the thumb in front and the fingers behind, he pushes the vertex to the right of the mother and brings it in the pelvis, at the same time that he inclines the uterus to the left, by placing the left hand upon the abdomen. The presentation is converted into the third vertex presentation, and the rest of the labour is accomplished by the efforts of nature.

When the breech is to the right of the pelvis, near the superior strait, the accoucheur introduces the left hand, and by placing the thumb in front and the fingers behind, he pushes it to the left and brings it to the centre of the pelvis, at the same time that he inclines the fundus uteri to the right by applying his right hand upon the belly. By this management, the presentation will be reduced to the first foot presentation, and the rest of the labour will be accomplished by the efforts of nature.

*Second indication.*—When the right side of the foetus is behind, the accoucheur introduces the right hand, and pushing it first above the pubis, and then to the right of the mother, he brings down the different parts of the foetus close together upon its an-

terior region, and in such a manner as to turn the feet to the left side of the pelvis. This being done, he passes his hand along the right side of the foetus until he reaches the feet, which he brings down in the manner already pointed out at page 38. The rest of the labour is finished as in the first presentation of the feet.

## SECOND PRESENTATION OF THE POSTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head is at the right cotyloid cavity, and the breech at the left sacro-iliac symphysis. The back presents downwards, the belly upwards, the right side forwards and to the left, and the left side backwards and to the right.

*Characteristic signs of the presentation.*—The spinous processes present obliquely in the direction of a line extending from the right cotyloid cavity to the left sacro-iliac symphysis. To this direction of the vertebral column, we may add the signs that may be drawn from the characters which we have assigned to the posterior region of the trunk.

### *Management.*

*First indication.*—When the head is to the right of the pelvis, near the superior strait, the accoucheur introduces the left hand, and by pushing to the left, he brings the vertex of the head to the centre of the pelvis, at the same time that he inclines the fundus uteri to the right, by applying his right hand to the abdomen of the mother. By this management the presentation is converted into the

fourth vertex presentation, which is terminated by the efforts of nature.

When the breech presents to the left of the pelvis near the superior strait, the accoucheur introduces the right hand, pushes the breech to the right and brings it to the centre of the pelvis, at the same time that he pushes the fundus uteri to the left, by applying the left hand upon the abdomen. By this means the presentation is converted into one of the second foot presentations, which terminates by the natural efforts of nature.

*Second indication.*—The left side of the fœtus being behind, the accoucheur introduces the left hand, and by pushing the fœtus first above the pubis, and then to the left of the mother, he disposes it in such a manner as to bring the feet to the right side of the pelvis. Then passing his hand along the left side of the fœtus until he reaches the feet, he brings them down in the same manner as was pointed out at page 38, and finishes the labour in the second presentation of the feet.

### THIRD PRESENTATION OF THE POSTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head corresponds to the right sacro-iliac symphysis, and the breech to the left cotyloid cavity. The back presents downwards, the belly upwards, the right side forwards and to the right, and the left backwards and to the left.

*Characteristic signs of the presentation.*—The spinous processes of the vertebræ present in the direction of a line, extending from the right sacro-iliac symphysis to the left cotyloid cavity. Posteriorly

and to the right are the characters peculiar to the superior parts of the fœtus, and anteriorly and to the left those belonging to its inferior parts.

### *Management.*

*First indication.*—If the head be found near the superior strait, when it presents to the right of the pelvis, the accoucheur introduces the left hand, pushes the head towards the left side of the mother, and inclines the uterus to the right. This being done, the labour terminates in the first vertex presentation by the natural effort.

If the breech be found near the superior strait, when it presents to the left of the pelvis, the accoucheur introduces the right hand, pushes to the right and inclines the uterus to the left. The rest of the labour terminates naturally by the third presentation of the feet.

*Second indication.*—The left side of the fœtus being posteriorly, the accoucheur introduces the left hand, and proceeds precisely in the same manner as in the second presentation.

### FOURTH PRESENTATION OF THE POSTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head is at the left sacro-iliac symphysis, and the breech at the right cotyloid cavity. The back presents downwards, the belly upwards, the right side backwards and to the right, and the left side forwards and to the left.

*Characteristic signs of the presentation.*—The spinous processes present obliquely in the direction of a line, extending from the left sacro-iliac sym-



physis to the right cotyloid cavity. The characters peculiar to the superior parts of the foetus are found posteriorly and to the left, and those belonging to its inferior parts are anteriorly and to the right.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur must bring it to the centre of the pelvis with the right hand, while with the other applied to the abdomen, he inclines the uterus to the left. This being done, the labour terminates naturally in the second vertex presentation.

If the breech be near the superior strait, the accoucheur brings it to the centre of the pelvis with his left hand, and inclines the uterus to the right. This being done, the labour naturally terminates in the fourth presentation of the feet.

*Second indication.*—The right side of the foetus being behind, the accoucheur introduces the right hand, and proceeds precisely in the same manner as in the first presentation.

I. When the head corresponds directly to the left side of the pelvis, and the breech to the right, the presentation will be characterized by the transverse direction of the spinous processes of the vertebræ. The superior parts of the foetus will be found to the left, and the inferior to the right of the pelvis.

*Management.*—The accoucheur should proceed to fulfil the two indications precisely in the same manner as in the first and fourth presentations, with this exception, that in fulfilling the first indication, he should endeavour to bring the extremity that is

in the centre of the pelvis to one of the first diagonal presentations of the vertex or of the feet.

II. When the head corresponds directly to the right side of the pelvis, and the breech to the left, the presentation will be characterized by the transverse direction of the spinous processes, and by the superior parts of the foetus being to the right and the inferior to the left.

*Management.*—In order to fulfil the two indications, the accoucheur proceeds precisely in the same manner as in the second and third presentations; only, that in fulfilling the first indication, he should endeavour to place the extremity in one of the first diagonal presentations of the vertex or of the feet.

III. When the head corresponds directly to the pubis and the breech to the sacrum, the trunk will present directly from before backwards, the superior parts will be anteriorly and the inferior posteriorly.

### *Management.*

*First indication.*—Head.—The accoucheur may introduce either hand and push backwards, so as to convert the presentation into the third vertex presentation, when he uses the right hand, and into the fourth, when he employs the left.

*Breech.*—The accoucheur should push forwards, and when he employs the right hand he should convert the presentation into the second presentation of the feet, and into the first, if he use the left.

*Second indication.*—The accoucheur may introduce either hand, and convert the presentation into the first or second diagonal, always taking care to

direct the side of the fœtus, which corresponds by name to the hand that is introduced, backwards.

IV. When the head corresponds directly to the sacrum, and the breech to the pubis, the trunk will have the same direction as in the preceding presentation; but we shall find that the superior parts of the fœtus will present posteriorly, and the inferior anteriorly.

*Management.*—If the head be near the superior strait, the accoucheur may introduce either hand, push towards the anterior part of the mother, and bring the extremity to the centre of the pelvis, so as to reduce it to the second vertex presentation when he uses the right hand, and to the first when he uses the left.

If the breech be near the superior strait, the accoucheur may introduce either hand—when he uses the right hand he should push backwards and convert the presentation into the third presentation of the feet, and into the fourth, when he uses the left.

*Second indication.*—The accoucheur may introduce either hand, and reduce the presentation to the third or fourth diagonal, by directing the side of the fœtus, which corresponds by name to the hand that is introduced, backwards.

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#### ANTERIOR REGION OF THE TRUNK.

The anterior part of the trunk comprehends the face, properly so called, the anterior part of the neck, the thorax, and the abdomen.

## DISTINGUISHING CHARACTERS OF EACH OF THESE PARTS.

*The face.*—Upon the mesian line are the small coronal suture, the nose, the mouth, and the chin; and laterally, the orbits and the cheeks. All these characters are so prominent and well marked, that there can be no difficulty in distinguishing the face, unless the soft parts should be much tumefied.

*Anterior part of the neck.*—The vicinity of the chin and of the superior part of the thorax, and the relative narrowness of the neck, are generally sufficient to enable us to distinguish this region of the foetus.

*The thorax.*—The characters which distinguish the thorax are drawn from the presence of the sternum, the clavicles, the ribs, and the intercostal spaces.

*The abdomen.*—The belly may be known by a soft tumour, bounded on one side by the last ribs, on the other by the bones of the pelvis, and presenting in its middle the insertion of the umbilical cord.

## PRESENTATIONS OF THE ANTERIOR REGION OF THE TRUNK.

The anterior region of the trunk may present in four principal directions, which correspond to the oblique diameters of the pelvis.

*Principal relations.*—The head corresponds to the left cotyloid cavity, and the breech to the right sacro-iliac symphysis. The belly is directed downwards, the back upwards, the left side backwards



and to the left, and the right side forwards and to the right.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the left cotyloid cavity to the right sacro-iliac symphysis. The superior parts of the fœtus are situated anteriorly, and the inferior posteriorly.

### *Management.*

*First indication.*—If the head be to the left of the pelvis near the superior strait, the accoucheur introduces the right hand so as to push to the right, and inclines the uterus to the left. By this management the presentation is reduced to the first vertex presentation, and terminates by the natural efforts.

If the breech be to the right of the pelvis, near the superior strait, we should push it up with the left hand, and incline the fundus uteri to the right, so as to reduce the presentation to the third foot presentation, which terminates by the natural efforts of the mother.

*Second indication.*—The left side of the fœtus being behind, the accoucheur should introduce the left hand, in order to push towards the left side of the mother; and then, by passing the hand along the posterior side until he reaches the feet, he should bring them down according to the rules laid down at page 38. The labour is to be finished in the second presentation of the feet.

### SECOND PRESENTATION OF THE ANTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head corresponds to the right cotyloid cavity, and the breech to the left

sacro-iliac symphysis. The belly presents downwards, the back upwards, the left side forwards and to the left, and the right backwards and to the right.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the right cotyloid cavity to the left sacro-iliac symphysis. The superior parts of the foetus are situated anteriorly, and the inferior posteriorly.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur introduces his left hand, and brings it to the centre of the pelvis, at the same time that he inclines the fundus uteri to the right. By this means the presentation is converted into the second vertex presentation, and terminates by the efforts of the woman.

If the breech be near the superior strait, the accoucheur brings it to the centre of the pelvis with his right hand, and inclines the uterus to the left. The presentation will be converted into the fourth natural presentation of the feet.

*Second indication.*—The right side of the foetus being behind, the accoucheur pushes it with the right hand towards the right side of the mother, and passing his hand along the right side of the foetus until he reaches the feet, he brings them down in the manner already pointed out at page 38. The rest of the labour is to be accomplished in the first foot presentation.

### THIRD PRESENTATION OF THE ANTERIOR REGION OF THE TRUNK.

*Principal relations.*—The head corresponds to the right sacro-iliac symphysis, and the breech to the left cotyloid cavity. The belly looks downwards, the back upwards, the left side forwards and to the right, and the right side backwards and to the left.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the right sacro-iliac symphysis to the left cotyloid cavity. The superior parts of the foetus are posteriorly, and the inferior anteriorly.

### *Management.*

*First indication.*—If the head be near the superior strait, we ought to bring it to the centre of the pelvis with the left hand, and incline the uterus to the right. By this management the presentation will be converted into the third natural vertex presentation.

If the breech present near the superior strait, it should be brought to the centre of the pelvis with the right hand, so as to convert the presentation into one of the first natural presentations of the feet.

*Second indication.*—The right side of the foetus being behind, the accoucheur introduces the right hand, and proceeds precisely in the same manner as in the second presentation.

FOURTH PRESENTATION OF THE ANTERIOR REGION  
OF THE TRUNK.

*Principal relations.*—The head corresponds to the left sacro-iliac symphysis, and the breech to the right cotyloid cavity. The belly presents downwards, the back upwards, the left side backwards and to the right, and the right side forwards and to the left.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the left sacro-iliac symphysis to the right cotyloid cavity. The superior parts of the fœtus are behind, and the inferior before.

*Management.*

*First indication.*—The head being to the left of the pelvis, the accoucheur brings it to the centre with the right hand, and inclines the uterus to the left. By this management the presentation is converted into the fourth natural presentation of the vertex.

If the breech be near the superior strait, the accoucheur brings it to the centre of the pelvis with the left hand, and inclines the uterus to the right; so as to convert the presentation into one of the second natural presentations of the feet.

*Second indication.*—The left side of the fœtus being behind, the accoucheur introduces the left hand, and proceeds altogether upon the same principles as in the first presentation.

I. When the head corresponds directly to the left side of the pelvis, and the breech to the right, the presentation will be characterized by the transverse



direction of the trunk, and by the superior parts of the fœtus being to the left, and the inferior to the right.

*Management.*—The management of the two indications of the first and fourth presentations is precisely the same; only, that in fulfilling the first, the accoucheur should endeavour to place the extremity, which he brings to the centre of the pelvis, in one of the first diagonal presentations of the vertex or of the feet.

II. When the head corresponds directly to the right side of the pelvis, and the breech to the left, the presentation may be distinguished by the transverse direction of the trunk, and by the superior parts of the fœtus being to the right.

*Management.*—The management of the two indications of the second and third presentations is precisely the same; only, that in fulfilling the first, we should bring the extremity to one of the first diagonal presentations of the vertex or of the feet.

III. When the head corresponds directly to the pubis, and the breech to the sacrum, the trunk extends directly from before backwards, and in front of the superior parts of the fœtus.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur may introduce either hand, and convert it into the first diagonal presentation of the vertex, when he uses the left hand, and into the second when he uses the right.

If the breech be near the superior strait, it should be brought to the centre of the pelvis, so as to be converted into the third diagonal presentation of

the feet, when we use the right hand, and into the fourth, when we use the left.

*Second indication.*—The accoucheur may introduce either hand, and convert the presentation into the first or second diagonal, but always in such a manner as to direct the side of the fœtus, which corresponds by name to the hand that is introduced, backwards.

IV. When the head corresponds directly to the sacrum and the breech to the pubis, the direction of the trunk will be the same as in the preceding presentation; but the superior parts of the fœtus will be behind.

### *Management.*

*First indication.*—If the head be near the superior strait, and the accoucheur wishes to convert the presentation into the third diagonal presentation of the vertex, he must introduce the right hand and push it forwards, and if he wishes to change it into the fourth, he must use the left.

If it be necessary to bring the breech to the centre of the pelvis, the accoucheur may introduce either hand; he should push backwards, and convert the presentation into the second diagonal of the feet with the right hand, and into the first with the left hand.

*Second indication.*—The accoucheur may introduce either hand, and convert the presentation into the third or fourth diagonal, taking care to direct the side of the fœtus, which corresponds by name to the hand that is introduced, backwards.

## LATERAL REGIONS OF THE TRUNK.

The lateral regions of the trunk comprehend the sides of the head, and of the neck, the shoulders, the sides of the thorax, and the loins.

## DISTINGUISHING CHARACTERS OF EACH OF THESE PARTS.

*Side of the head.*—This is chiefly characterized by the ear, whose different relations with the pelvis are so well marked, that there is no difficulty in distinguishing either the side or the direction in which it presents. Thus, we know that the lobe corresponds to the feet, and the great convexity of the helix to the back.

*Side of the neck.*—This is less distinguishable by itself, than by the neighbouring parts; thus, the presence of the ear on one side, and that of the shoulder on the other, can scarcely deceive us in recognizing the lateral region of the neck.

*Shoulder.*—The shoulder may be known by its presenting under the form of a rounded tumour, by the clavicle in front, and the scapula behind; our diagnosis may also be farther aided by the presence of the arm and the hollow of the axilla.

*Side of the thorax.*—This region is characterized by the ribs and the intercostal spaces. Superiorly it has the hollow of the axilla, inferiorly the side of the parietes of the abdomen, anteriorly the sternum, and posteriorly the spinous processes of the vertebræ.

*Loin.*—This region is distinguishable by its softness, by the presence of the last rib above, and by that of the bones of the ilium below.

## PRESENTATIONS OF THE RIGHT LATERAL REGIONS.

The right lateral region of the foetus may present in four principal directions, which correspond to the oblique diameters of the pelvis.

## FIRST PRESENTATION OF THE RIGHT SIDE.

*Principal relations.*—The head corresponds to the left cotyloid cavity, and the breech to the right sacro-iliac symphysis. The right side presents downwards, the left upwards, the back forwards and to the right, and the belly backwards and to the left.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the left cotyloid cavity to the right sacro-iliac symphysis. The superior parts of the foetus are anteriorly and the inferior posteriorly.

*Management.*

*First indication.*—It requires precisely the same management as in the presentations of the back and the belly.

*Second indication.*—The right side of the foetus being below, the accoucheur introduces his right hand, pushes it to the right of the mother and bends the foetus upon its anterior face, so as to bring the inferior extremities to the left side of the pelvis. This being done, he carries his hand along the right side of the foetus until he reaches the feet, which he brings down according to the rules laid down at page 38. The labour is finished in the first presentation of the feet.



## SECOND PRESENTATION OF THE RIGHT SIDE.

The head corresponds to the right cotyloid cavity, and the breech to the left sacro-iliac symphysis. The right side presents downwards, the left upwards, the back backwards and to the right, and the belly forwards and to the left.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the right cotyloid cavity to the left sacro-iliac symphysis. The superior parts of the trunk are anteriorly, and the inferior posteriorly.

*Management.*

*First indication.*—This should be fulfilled precisely in the same manner as in the presentations of the back and the belly.

*Second indication.*—The right side being below, the accoucheur introduces the right hand, and pushing to the right side of the pelvis, he passes his hand along the right side of the fœtus until he reaches the feet, which he brings down in the manner pointed out at page 38. The labour is finished in the first presentation of the feet.

## THIRD PRESENTATION OF THE RIGHT SIDE.

*Principal relations.*—The head is to the right sacro-iliac symphysis, and the breech to the left cotyloid cavity. The right side is below, the feet above, the back behind and to the left, and the belly before and to the right.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending

from the right sacro-iliac symphysis to the left cotyloid cavity. The superior parts of the trunk are posteriorly, and the inferior anteriorly.

### *Management.*

*First indications.*—It requires the same management as in the presentations of the back and the belly.

*Second indication.*—It demands precisely the same management as in the second presentation.

#### FOURTH PRESENTATION OF THE RIGHT SIDE.

*Principal relations.*—The head corresponds to the left sacro-iliac symphysis, and the breech to the right cotyloid cavity. The right side is below, the left above, the back anteriorly and to the left, and the belly posteriorly and to the right.

*Characteristic signs of the presentation.*—The trunk presents in the direction of a line, extending from the left sacro-iliac symphysis to the right cotyloid cavity. The superior parts of the trunk are posteriorly, and the inferior anteriorly.

### *Management.*

*First indication.*—It requires the same management as in the presentations of the back and the belly.

*Second indication.*—It demands the same management as in the first presentation.

1. When the head corresponds directly to the left side of the pelvis, and the breech to the right, the trunk will present in a transverse direction; and the

superior parts of the fœtus will be to the left, and the inferior to the right.

*Management.*—The management of the two indications is precisely the same as in the first and fourth presentations; only, that in fulfilling the first indication, we should bring the extremity to one of the first diagonal presentations of the vertex of the head, or of the feet.

II. When the head corresponds directly to the right side of the pelvis, and the breech to the left, the trunk will have a transverse direction, as in the preceding presentation, but the superior parts of the fœtus will be to the right, and the inferior to the left.

*Management.*—The management in the two indications is precisely the same as in the second and third presentations. But, in fulfilling the first indication, we should proceed as in the preceding presentation.

III. When the head corresponds directly to the pubis, and the breech to the sacrum, the trunk will extend directly from before backwards, and the superior parts of the fœtus will be anteriorly, and the inferior posteriorly.

### *Management.*

*First indication.*—If it be necessary to bring the head to the centre of the pelvis, the accoucheur may introduce either hand, (the right hand should be preferred,) and turn it backwards, so as to convert the presentation into the second diagonal presentation of the vertex of the head.

If it be necessary to bring the breech to the centre of the superior strait, the accoucheur should in-

introduce the right hand, though he may use either, and push the breech forwards, so as to convert the presentation into the second presentation of the feet.

*Second indication.*—The right side of the foetus being below, the accoucheur introduces the right hand, and converts the presentation into the second diagonal, and proceeds upon the same principles as he would in the latter presentation.

IV. When the head corresponds directly to the sacrum, and the breech to the pubis, the trunk will be in the same direction as in the preceding presentation; but the superior parts of the foetus will be posteriorly, and the inferior anteriorly.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur should introduce the left hand, though he may use either, and push it forwards so as to bring it to the first vertex presentation.

If the breech be near the superior strait, the accoucheur should introduce the left hand, though he may use either, and push the breech backwards, so that by bringing it to the centre of the pelvis, he may convert it into the first foot presentation.

### PRESENTATIONS OF THE LEFT LATERAL REGION OF THE TRUNK.

The left lateral region of the trunk, like the right, presents in four principal directions, which correspond to the oblique diameters of the pelvis.



## FIRST PRESENTATION.

*Principal relations.*—The head corresponds to the left cotyloid cavity, and the breech to the right sacro-iliac symphysis. The left side is below, the right above, the back posteriorly and to the left, and the belly anteriorly and to the right.

*Characteristic signs of the presentation.*—These are precisely the same as in the first presentation of the right side.

*Management.*

*First indication.*—It requires the same management as in the first presentation of the right side.

*Second indication.*—The left side of the foetus being below, the accoucheur introduces the left hand, and having pushed the foetus towards the left side of the mother, he passes his hand along its left side, until he reaches the feet, which he brings down in the manner pointed out at page 38. The labour is to be finished in the second presentation of the feet.

## SECOND PRESENTATION.

*Principal relations.*—The head corresponds to the right cotyloid cavity, and the feet to the left sacro-iliac symphysis. The left side of the foetus is below, the right above,—the back anteriorly and to the left, and the belly posteriorly and to the right.

*Characteristic signs of the presentation.*—These are the same as in the second presentation of the right side.

### *Management.*

*First indication.*—The same rules are to be observed as in the second presentation of the right side.

*Second indication.*—The left side being below, the accoucheur introduces the left hand, and by pushing the foetus to the left of the mother, he bends it forwards in such a manner as to bring the inferior extremities to the right side of the pelvis. This being done, he passes his hand along the left side of the foetus, until he reaches the feet, which he delivers according to the rules laid down at page 38. The rest of the labour is to be accomplished in the second presentation of the feet.

### THIRD PRESENTATION.

*Principal relations.*—The head corresponds to the right sacro-iliac symphysis, and the breech to the left cotyloid cavity. The left side of the foetus is below, the right above, the back anteriorly and to the right, and the belly posteriorly and to the left.

*Characteristic signs of the presentation.*—These are the same as in the third presentation of the right side.

### *Management.*

*First indication.*—In the first indication, the same rules are to be observed as in that of the third presentation of the right side.

*Second indication.*—This requires the same man-

agement as that of the second presentation of the left lateral region.

#### FOURTH PRESENTATION.

*Principal relations.*—The head corresponds to the left sacro-iliac symphysis, and the breech to the right cotyloid cavity. The left side is below, the right above, the back posteriorly and to the right, and the belly anteriorly and to the left.

*Characteristic signs of the presentation.*—These are the same as in the fourth presentation of the right side.

#### *Management.*

*First indication.*—The same rules are to be observed as in the fourth presentation of the right side.

*Second indication.*—This requires the same management as that of the first presentation of the left lateral region.

I. When the head corresponds directly to the left side of the pelvis, and the breech to the right, the presentation will be characterized by the same signs as in the presentation of the right lateral region.

#### *Management.*

*First indication.*—In this indication the same rules are to be observed as in that of the presentation of the right side.

*Second indication.*—This indication requires the same management as that of the first and fourth diagonal presentations of the left lateral region.

II. When the head corresponds directly to the right side of the pelvis, and the breech to the left, the presentation will be characterized by the same signs as that of the right lateral region.

### *Management.*

*First indication.*—In this indication, the same rules are to be observed as in that of the corresponding presentation of the right side.

*Second indication.*—It requires the same management as that of the second and third diagonal presentations of the left lateral region.

III. When the head corresponds directly to the symphysis pubis, and the breech to the sacrum, we may distinguish the presentation by the same characters as in that of the right lateral region.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur should introduce the left hand, though he may employ either, and by pushing the head backwards, he should bring it to the first vertex presentation.

If the breech be near the superior strait, the accoucheur may introduce either hand, though he should always prefer the left, and by pushing the breech forwards, he should bring it to the first natural presentation of the feet.

*Second indication.*—The left side of the fœtus being below, the accoucheur introduces the left hand, and by pushing to the left, he converts the presentation into the first diagonal, and proceeds



afterwards upon the same principles as he would in that presentation.

IV. When the head presents towards the sacrum and the breech towards the symphysis pubis, the presentation will be characterized by the same signs as in the corresponding presentation of the right side.

### *Management.*

*First indication.*—If the head be near the superior strait, the accoucheur may introduce either hand, though he should prefer the right, and by pushing the head forwards, he should bring it to the second diagonal presentation of the vertex.

If the breech be near the superior strait, he may introduce either hand, though he should give the preference to the right, and by pushing the breech backwards, he should bring it to the second natural presentation.

*Second indication.*—The left side being below, the accoucheur introduces the left hand, and by pushing to the left, he endeavours to convert the presentation into the fourth diagonal, and proceeds afterwards in the same manner as in that presentation.

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### PRESENTATIONS OF THE HAND.

When the parts of the mother are well formed, the presentation of the hand can afford no obstacle to the termination of the labour, whether it takes place by the breech or by the head.

This being the case, it is obvious that it is neither proper to remove the arm by amputation or other-

wise, in order to diminish the volume of the fœtus, or to return it into the uterus, as we have been advised to do by a number of writers on midwifery. It is only, in fact, in those cases where the arm is at the superior strait of the pelvis, that we should push it up, or sustain it, until the head or the breech has descended into the opening of the strait.

In case, therefore, one of the arms of the fœtus is in the vagina, or in case it has passed the parts of generation, the labour should be conducted precisely in the same manner as if it were still in the uterus; with the exception, that the arm should be secured by means of a noose, to prevent its return and to maintain it on the trunk during the delivery.

To verify the facts which we have just asserted, let us give an example of a presentation of the lateral regions of the fœtus, where one of the arms has already descended. We shall suppose it to be the first presentation of the left side, accompanied by the left arm.

### *Management.*

The limb being fixed by means of a noose placed around the wrist, the accoucheur introduces his left hand and carries it along the other arm, until he reaches the trunk, which he pushes towards the left side of the mother, and proceeds to deliver the feet precisely in the same manner as if the arm were within the uterus. When the feet are brought out, he finishes the labour precisely in the same manner as in the second foot presentation, taking care, at the same time, to keep the arm against the trunk, so as to bring it down with it.

*Remark.*—The arm which presents within the

genital parts of the mother, may not always belong to the side of the fœtus which is below; so that it is absolutely necessary, before we proceed to the delivery, to carry the hand as far up as where it is articulated with the trunk, in order to ascertain precisely to which side it belongs. In every case, where we terminate the labour, we should use the hand which corresponds by name to the side of the fœtus that presents.

The direction of the hand that is delivered, may indicate the presentation of the trunk at the superior strait of the pelvis; but we can only be certain after we have made an examination with the hand.

If simple inspection does not enable the accoucheur to distinguish the hand that has passed the vulva, he may remove every doubt by comparing it with his own, which will correspond to it in all its parts.

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#### RECAPITULATION OF THE DIFFERENT MANAGERMENTS APPLICABLE TO THE PRESENTATIONS OF THE TRUNK.

All the presentations of the trunk, whatever region the fœtus may present, require the fulfilment of two indications.

The first, which consists in bringing the nearest extremity of the fœtus to the centre of the pelvis, requires precisely the same management in all the diagonal presentations, and in all those where the extremity of the fœtus corresponds directly to either side of the pelvis, whether it be the anterior, the posterior, or lateral regions that present.

When the extremity, whatever it be, presents

to the left of the mother, the accoucheur must introduce his right hand so as to push it to the right, while, with the other applied to the abdomen, he inclines the uterus towards the left.

When it presents to the right, he must push it to the left, and incline the uterus to the right.

In the direct presentations, the accoucheur may introduce either hand, and by pushing to the side oppositely to that towards which the extremity of the fœtus presents, he should bring it to the centre of the pelvis, and convert it always into a diagonal presentation.

As soon as the first indication is fulfilled, the labour will terminate by the efforts of nature.

The second indication consists in passing the hand along one of the sides of the fœtus, in order to bring down its feet. This side is directed backwards in all the diagonal presentations of the anterior and posterior regions, and in all those where the extremities of the fœtus correspond directly to the lateral regions of the pelvis: in the corresponding presentations of the lateral regions of the trunk, it is below.

In order to fulfil this second indication, the accoucheur should always introduce the hand which corresponds, by name, to the side of the fœtus along which he is obliged to pass it.

The direct presentation should always be converted into the diagonal, and should be managed upon similar principles.

When one arm only is delivered, it should have no influence upon the management of the presentations of the trunk.



## OF COMPOUND LABOUR.

When there are two or more children in the uterus, they should be delivered according to the rules which have been pointed out in the preceding parts of this work.

I. If they both present the feet, we should first remove the one whose heels correspond to the hand that is introduced, and in order to be convinced that we have both feet of the same child, we should carry the fingers as high up as the hips.

II. If they both present the head, the accoucheur should, in preference, turn that whose side, corresponding in name with the hand introduced, presents backwards; and the head of the second infant should be pushed up to a considerable extent if it be likely to enter the superior strait.

III. If one of the infants present the head and the other the feet, the accoucheur should commence with the latter, unless, as Dr. Capuron has remarked, the head of the first has already descended so far down as to demand the application of the forceps.

IV. If they both be placed across the superior strait, and in the same direction, the accoucheur should first bring down the one whose feet are the most easy of access.

If one head be to the right and the other to the left, the accoucheur should first bring down the infant whose feet are to the left of the pelvis, provided he has introduced the right hand, and *vice versa*.

## SECTION II.

## OF INSTRUMENTAL LABOURS.

The peculiar causes of these kinds of labour are the same as in those which terminate by mere manual assistance, with the exception, that they may sometimes be attended with certain mal-conformations, which may be so great as to preclude the possibility of terminating the labour by the natural passages, without a previous operation.

*Instruments.*—The instruments are three in number, the forceps, the lever, and the blunt hooks.

## APPLICATION OF THE FORCEPS.

*Description of the forceps.*—The forceps used at the present day, represent a kind of lever, composed of two blades which are united by a joint.

Each of these blades has three distinct parts, a middle and two extremities.

The extremity, which is destined to embrace the head, is a large blade having a fenestra, and curves, one upon its borders, and the other on its faces. These two curves are arranged in such a manner that they may always be adapted to the form of the pelvis of the mother and to that of the child's head.

The second extremity forms the handle of the instrument. Each branch terminates in a hook, one of which serves as a perforator, and the other as a crotchet.

The middle part serves to unite the blades, one of which contains a screw, moveable in every direc-

tion, and the other, an elongated mortise hole. This hole receives the screw, which serves, by its transverse direction, to unite the two blades.

When speaking of the blades, we shall call that which contains the screw the left blade, and that which contains the mortise the right.

The head of the foetus is the only part upon which we can apply the forceps. This instrument is not only proper in cases where the head presents first, but also in those where it is retained after the trunk has been already delivered.

The forceps, when properly applied, embrace the lateral regions of the head, in the direction of the occipito-mental diameter. In this manner, the longest diameter of the head will always be represented by one of its extremities.

The forceps are applicable to both straits of the pelvis.

### *General Rules for the Application of the Forceps.*

1. When the head of the foetus is placed in a direct position,\* the accoucheur should first introduce the left blade with his left hand, and then the right with his right hand.

2. Whenever the head is placed diagonally, the accoucheur should ascertain which of the extremities of the antero-posterior diameter is in front. When the occiput or the forehead corresponds to

\* We shall always call those presentations direct, in which the occipito-frontal diameter of the head is placed in the direction of the antero-posterior diameter of the pelvis.

the left cotyloid cavity, the accoucheur should first introduce the right blade, and then the left, and in both he should use the right hand; for in all the diagonal presentations, both blades should be introduced with the same hand.

3. When the occiput or the forehead corresponds to the right cotyloid cavity, the left blade must be introduced first and with the left hand.

4. The blades should always be placed in such a manner, that the convexity of their curves shall correspond to the concavity of the pelvis, and their concavity to the convexity of the head.

5. The hand, which remains free, should always be used as a guide to the blades, and be directed behind the sacro-iliac symphysis. It should be placed between the head and the uterus, when the head is still within the uterus, and between the vagina and the head, when it has passed the os tinæ. In this manner we may always avoid wounding the uterus or the vagina.

6. Each blade of the forceps should be held firmly in the hand, with the thumb placed along the external side of the joint.

7. The forceps should be warmed and oiled, so as to facilitate the introduction.

8. The patient should be placed in the same position as in manual labour.

9. In order to introduce the forceps, the accoucheur should place himself between the thighs of the mother, and then, passing each blade in succession behind the head, he applies them upon its lateral regions by means of the hand that is introduced into the parts. In order to bring the blade to its proper place, he should glide the index finger



behind the upper edge of the blade, and the middle finger behind, and the thumb below the lower edge.

10. When the instrument is applied, the accoucheur may place himself to either side of the handle in the direct presentations, but in the diagonal, he should always place himself behind it.

11. The accoucheur, in order to grasp the forceps after they have been applied, must place his hands differently in the presentations of the inferior, and in those of the superior strait.

In the presentations of the superior strait, the hand, which holds the handle of the forceps, should be placed below the instrument, while that which is near the vulva should be placed above.

In the presentations of the inferior strait, the method of proceeding is directly opposite, with this exception, that the index finger of the hand, which is near the vulva, should be carried as high up as the head, in order to ascertain whether it follows the motions which the forceps are intended to impress upon it.

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#### PRESENTATIONS OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT OF THE PELVIS.

With respect to the application of the forceps, accoucheurs generally admit six principal presentations of the head at the inferior strait of the pelvis, viz. two direct, and four diagonal. We shall speak first of what relates to the direct presentations.

FIRST DIRECT PRESENTATION OF THE VERTEX OF  
THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the symphysis pubis, and the forehead to the hollow of the sacrum.

We shall not recapitulate the signs by which we may distinguish each presentation of the head, these having already been detailed in the article on manual labour.

*Application of the forceps.*—The accoucheur, taking the left blade in his left hand, inclines its handle towards the right groin, and carries it along the right hand which directs it to the side of the head which corresponds to the left of the pelvis. As soon as the blade begins to enter, it should be supported by the thumb placed behind its posterior edge.

When this blade has been properly applied, it should be parallel with the axis of the inferior strait, and its screw should be opposite the centre of the vulva.—It should be held firmly by an assistant.

The accoucheur then takes the other blade in his right hand, and, by inclining the handle towards the left groin of the mother, he should carry it to the side of the head which corresponds to the right of the pelvis.

This being done, he locks the instrument, and placing himself to one side, he should grasp the forceps in the manner pointed out at page 38, and should move the head laterally, first depressing it in order to bring the occiput below the pubes, and then elevating it so as to follow the axis of the inferior strait. The accoucheur should take care,

from time to time, to push the head back into the pelvis, in order that the parts may not be dilated too suddenly. When the perineum is much distended, it should be supported with the hand near the vulva, while with the other, the forceps should be turned towards the abdomen of the mother.

When the head is delivered, the accoucheur should support the handle of the instrument upon his breast, and after having unlocked the blades, he should cautiously withdraw them one after the other.

When the head has been delivered, and the trunk can not be disengaged by the natural efforts, the accoucheur should grasp the fœtus by its two shoulders, and extract it in the direction of the axis of the inferior strait.

If the fingers alone be not sufficient to enable the accoucheur to accomplish the delivery, he should apply a blunt hook in the posterior axilla, and proceed in the manner that we shall point out when speaking of the application of the hooks.

## SECOND DIRECT PRESENTATION OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the hollow of the sacrum, and the forehead to the symphysis pubis.

*Application of the forceps.*—The application of the forceps is precisely the same as in the preceding presentation, with this exception, that the handle of the instrument should be less elevated, that it may the better embrace the head in the direction of its length.

The extraction of the head is also effected in the same manner as in the preceding presentation, with

the exception, that as the face is above, after the occiput has passed, the accoucheur should move the head from side to side, and should endeavour to pass up the hand which holds the handle of the forceps, so that by firmly depressing the instrument, he may bring the face below the pubes.

In this case it is not necessary to unlock the forceps, it being easy to remove them, without fear of wounding the parts of the mother, merely by relaxing the blades.

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#### DIAGONAL PRESENTATIONS OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

##### FIRST DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the left cotyloid cavity, and the forehead to the right sacro-iliac symphysis.

*Application of the forceps.*—The occiput corresponding to the left cotyloid cavity, the accoucheur takes the right blade in his right hand, and after having inclined it towards the left groin, he carries it along the left hand to the anterior side of the child's head. The thumb ought to be placed under the posterior edge of the blade as soon as it begins to enter, and when it is properly applied, it should be given to an assistant. The accoucheur then taking the other blade in the same hand, carries it below the first, and using his left hand as a guide, he glides it upon the posterior side of the head.

Both blades being properly fixed, the accoucheur



should withdraw the left hand, and lock the instrument. Then placing himself behind the forceps, he grasps them in the manner already pointed out, rotates the head, and after the occiput is brought below the pubes and the face in the hollow of the sacrum, he should proceed precisely in the same manner as in the first direct presentation.

#### SECOND DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the right cotyloid cavity, and the forehead to the left sacro-iliac symphysis.

*Application of the forceps.*—The occiput corresponding to the right cotyloid cavity, the accoucheur should take the left blade in the left hand, and after having inclined it towards the right groin, he should carry it upon his right hand, which is to be used as a conductor, upon the anterior side of the head, taking care to place the thumb under the posterior edge of the blade, as soon as it begins to enter. The blade being now held by an assistant, the accoucheur should carry it back without removing his hand from the vagina, and then taking the other blade in the same hand with which he introduced the first, he should glide it in front of it, and by using the hand, which was left in the parts, as a conductor, he should carry it upon the posterior side of the head.

Both blades being introduced, the accoucheur withdraws his right hand, and locks the instrument. Then, placing himself behind, he applies his hands in the manner already pointed out, rotates the head, and proceeds afterwards precisely in the same manner as in the first direct presentation.

### THIRD DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the right sacro-iliac symphysis, and the forehead to the left cotyloid cavity.

*Application of the forceps.*—The forehead corresponding to the left cotyloid cavity, the forceps should be applied in the same manner as in the first diagonal presentation; but as the face presents upwards, the handle of the instrument should be less elevated than in the preceding presentations, in order that the head may be more easily grasped in the direction of its length.

The instrument being applied, the accoucheur places himself behind it, rotates the head, and after having thus brought the occiput in the hollow of the sacrum, and the face below the pubes, he should proceed in the same manner as in the second direct presentation.

### FOURTH DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE INFERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the left sacro-iliac symphysis, and the forehead to the right cotyloid cavity.

*Application of the forceps.*—The forehead corresponding to the right cotyloid cavity, the forceps should be applied in the same manner as in the second diagonal presentation, with the exception, that the handle of the instrument should be more depressed. The accoucheur then placing himself behind the forceps, rotates the head, and proceeds in

the same manner as in the second direct presentation.

I. When the occiput corresponds directly to the left side of the pelvis, and the forehead to the right, the accoucheur should proceed precisely in the same manner as in the first and third diagonal presentations, with this exception, that one of the blades should be placed under the pubes, and the other in front of the sacrum.

II. When the occiput corresponds directly to the right side of the pelvis, and the forehead to the left, the accoucheur should proceed in the same manner as in the second and fourth diagonal presentations.

#### PRESENTATIONS OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT OF THE PELVIS.

The head may present at the superior strait in the same manner as at the inferior.

#### FIRST DIRECT PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput is above the symphysis pubis, and the forehead in front of the sacro-vertebral angle.

*Application of the forceps.*—The blades of the forceps should be applied precisely in the same manner as in the first direct presentation of the inferior strait, with the exception, that they must be carried farther up, and that the hand which serves as a conductor, should be placed between the uterus and the head of the foetus.

When the forceps are applied, the accoucheur grasps them in the same manner as was pointed out

when speaking of the presentations of the superior strait, and accordingly as the head is placed to the left or to the right, he brings it to the first or second diagonal presentation of the superior strait. In order to produce this conversion, it is often necessary to push the head a little above the superior strait, and when it is placed in a diagonal position, to bring it into the cavity of the pelvis by following the axis of the superior strait, and by inclining the handle of the instrument to the corresponding side of the thigh. By this management, the presentation will be converted into the first diagonal presentation of the inferior strait; and then, by placing his hands as was directed when speaking of the presentations of the inferior strait, he rotates the head, and proceeds in the same manner as in the first presentation of the inferior strait.

#### SECOND DIRECT PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—The occiput corresponds to the sacro-vertebral angle, and the forehead to the symphysis pubis.

*Application of the forceps.*—The forceps are applied precisely in the same manner as in the preceding presentation, with the exception, that the handle of the instrument should be more depressed, in order that the head may be more readily grasped in the direction of its length.

When the instrument is applied, the accoucheur places himself either to the right or left side, and then, by pushing the head a little above the superior strait, he brings it to the third or fourth diagonal presentation. This being done, he draws the head



into the cavity of the pelvis by following the axis of the superior strait, and by inclining the handle of the forceps to the side of the corresponding thigh. The rest of the labour is to be conducted upon the same principles as in the diagonal presentations of the inferior strait.

#### FIRST DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as at the corresponding presentation at the inferior strait, with the exception, that the head is less engaged.

*Application of the forceps.*—The application of the forceps is precisely the same as at the inferior strait, with the exception, that the blades and the hand which directs them must be carried into the interior of the uterus. The instrument being applied, the accoucheur should place himself behind it, and bring the head into the cavity of the pelvis; taking care always to follow the direction of the axis of the superior strait, by inclining the handle of the forceps towards the side of the left thigh. By this management, the presentation is converted into the first diagonal presentation of the inferior strait, and the accoucheur should proceed exactly according to the rules laid down for the management of that presentation.

#### SECOND DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—These are the same as in the corresponding presentation of the inferior strait, except that the head is less engaged.

*Application of the forceps.*—The application of the forceps is exactly the same as in the corresponding presentation of the inferior strait, excepting that the blades and the hand which guides them, should be carried farther up. The head is to be brought to the second diagonal presentation of the inferior strait, taking care to follow the direction of the axis of the superior strait, by inclining the handle of the instrument towards the right thigh; then, changing the position of his hands, the accoucheur converts the presentation into the first direct, and terminates the labour according to the rules laid down for the management of that presentation.

#### THIRD DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—They are the same as in the corresponding presentation of the inferior strait.

*Application of the forceps.*—The forceps are to be applied in the same manner as at the inferior strait, except that they should be carried into the interior of the uterus. When the instrument is applied, the accoucheur should place himself behind it, and bring the head to the third diagonal presentation of the inferior strait; and then, by rotating it, he should terminate the labour in the same manner as in the second direct presentation of the inferior strait.

#### FOURTH DIAGONAL PRESENTATION OF THE VERTEX OF THE HEAD AT THE SUPERIOR STRAIT.

*Principal relations.*—They are the same as in the corresponding presentation of the inferior strait.

*Application of the forceps.*—The forceps are applied in the same manner as in the corresponding presentation of the inferior strait. When the instrument is properly fixed, the accoucheur places himself behind it, and brings the head to the fourth diagonal presentation of the inferior strait, and proceeds according to the rules laid down for the management of that presentation.

I. When the occiput corresponds directly to the left side of the pelvis, and the forehead to the right, the accoucheur should proceed in the same manner as in the first and third diagonal presentations, except, that the first blade should be placed under the pubes, and the second in the hollow of the sacrum. The rotary motion, which is impressed upon the head, should always be made with the view of bringing the occiput below the pubes, and the face in the hollow of the sacrum.

II. When the occiput corresponds directly to the right side of the pelvis, and the forehead to the left, the accoucheur should proceed upon the same principles as in the second and fourth diagonal presentations, with the exception, that the blades should be placed in the same manner as in the preceding presentation, one in front and the other behind. This being done, the occiput is to be brought below the pubes, and the face to the hollow of the sacrum.

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#### OF IMPACTION OF THE HEAD AT THE SUPERIOR STRAIT.

Authors, generally, admit two kinds of impaction of the head at the superior strait of the pelvis.

In the first kind, the antero-posterior diameter of

the superior strait is less than four inches, and the head of the fœtus is impacted in its occipito-frontal diameter.

In the second kind, the antero-posterior diameter of the superior strait, is less than three inches and a half, and the head of the fœtus is impacted in its bi-parietal diameter.\*

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### FIRST KIND OF IMPACTION.

#### IMPACTION OF THE HEAD IN ITS OCCIPITO-FRONTAL DIAMETER.

The head of the fœtus may be impacted in its long diameter in two different presentations.

##### FIRST PRESENTATION.

*Relations.*—The occiput corresponds to the symphysis pubis, and the forehead to the sacrum.

##### SECOND PRESENTATION.

*Relations.*—The occiput corresponds to the sacrum, and the forehead to the symphysis pubis.

*Indications to be fulfilled.*—The head should be pushed up, so as to bring it to one of the diagonal presentations—a circumstance which may always be accomplished in these presentations.

*Application of the forceps.*—In both these presentations, the forceps should be applied precisely

\* The bi-parietal diameter is the tranverse diameter which extends from one parietal protuberance of the head to the other.—S. D. G.



in the same manner as in the first and second direct presentations of the vertex of the head at the superior strait, with the exception, that the blades are not to be carried quite so high up. The accoucheur, placing himself either to the right or the left of the instrument, should push the head, by moving it a little laterally, so as to bring it to one of the diagonal presentations of the superior strait. This being done, he is to proceed exactly upon the same principles as in that presentation.

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## SECOND KIND OF IMPACTION.

### IMPACTION OF THE HEAD IN ITS BI-PARIETAL DIAMETER.

The head of the fœtus may be impacted in its bi-parietal diameter in two different presentations.

#### FIRST PRESENTATION.

*Relations.*—The occiput presents directly to the left side of the pelvis, and the forehead to the right.

#### SECOND PRESENTATION.

*Relations.*—The occiput corresponds to the right side of the pelvis, and the forehead to the left.

*Indications to be fulfilled.*—1. If the fœtus be dead, it is advisable to open the cranium, in order to diminish its volume, and to remove it by means of the crotchets.

2. If the fœtus be alive, we ought, above all things, to extract it by means of the forceps. But

upon what part of the head ought we to apply the blades?

M. Capuron, well aware that the head may always be pushed up, rejects the application of the forceps upon the face and the occiput, and advises us to push up the head in all cases, and to apply the forceps upon its lateral regions. He is of opinion, that the instrument adds but little to the thickness of the head, and that by pushing it up it may be sufficiently reduced to enable us to bring it into the cavity of the pelvis.

If then we prefer pushing up the head above the superior strait, we should remember, with M. Capuron, to apply the blades of the forceps upon the lateral regions of the head, and in introducing them to observe the relations between the occiput and the pelvis. If the occiput present directly to the left, we should introduce the blades in the same manner as in the first and third diagonal presentations; but if it present to the right, we should proceed upon the same principles as in the second and fourth diagonal presentations.

But should it prove impossible to push the head above the superior strait, we should remember with Professor Baudelocque, to place one of the blades of the forceps upon the face, and the other upon the occiput.

In applying the instrument, we should observe the rules that were laid down when speaking of the direct presentations. The head should be brought into the cavity of the pelvis, in the direction of the axis of the superior strait, and the blades of the forceps should be re-applied upon its lateral regions.

In order to simplify this secondary application of the forceps as much as possible, we ought not to

withdraw the blade, which, according to the relations of the occiput, should be placed behind, though in re-applying the blades, we should conform, in every respect, to the rules laid down when speaking of the transverse presentations.

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### PRESENTATIONS OF THE FACE.

The face of the fœtus presents in six principal directions at the inferior and superior straits.

Of these six presentations, two are direct and four diagonal.

*Indications to be fulfilled.*—In the presentations of the face the accoucheur is obliged to fulfil two indications; one consists in turning the fœtus in order to deliver it by the feet, and the other in correcting the position of the head.

If the fœtus can be turned, the accoucheur should proceed in the same manner as in the presentations of the vertex of the head; if not, he should endeavour to place the occiput in such a manner that the head may present by one of the extremities of its longest diameter.

The position of the occiput may be corrected by means of the hand alone, but, as we have already had occasion to speak of it when treating of the anterior region of the trunk, we shall not again revert to it.

The position of the occiput may also be remedied by means of the lever, as we shall show when treating of the application of that instrument.

When the accoucheur has corrected the position of the head by either of these means, he should abandon the labour to the efforts of nature, unless

there be some accident which should oblige him to have recourse to the forceps, which should then be applied, as in the presentations of the vertex.

In case the position be such, however, that the occiput can not be brought down, either with the hand, or the lever, we should, above all things, have recourse to the forceps.

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#### PRESENTATIONS OF THE FACE AT THE INFERIOR STRAIT.

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##### FIRST DIRECT PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead corresponds to the symphysis pubis, and the chin to the hollow of the sacrum.

*Characteristic signs of the presentation.*—As we have already had occasion to point out the characteristic signs of these presentations, in speaking of the anterior region of the trunk, we shall not revert to them on the present occasion.

*Application of the forceps.*—The forceps should be introduced in the same manner as in the direct presentations, with the exception, that the head should be grasped only in the direction of the occipito-frontal diameter. When the instrument is properly fixed, the accoucheur holds the handle in one hand and depresses the occiput, while with the other, placed under the edge of the blades, he pushes the face into the interior of the pelvis. When the



position of the head is corrected, he should separate the blades without unlocking them, and pass them in the direction of the occipito-mental diameter, by elevating the handle of the instrument. This being done, he should terminate the labour as in the first vertex presentation.

## SECOND DIRECT PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead corresponds to the hollow of the sacrum, and the chin to the symphysis pubis.

*Application of the forceps.*—In this presentation the forceps are applied in the same manner as in the preceding, but as it is possible to grasp the head in the direction of its occipito-mental diameter, by considerably elevating the handle of the instrument, it would be perfectly useless to correct the position of the occiput, because the chin will be delivered first.

The forceps being applied, the accoucheur should place himself to one side and dispose his hands as is customary in the presentations of the inferior strait. Then, moving the head laterally, he should first depress the handle of the instrument in order to disengage the chin from below the pubes; and this being done, he should turn it towards the abdomen of the mother, so as to disengage the occiput which is behind.

### FIRST DIAGONAL PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead presents to the left cotyloid cavity, and the chin to the right sacro-iliac symphysis.

*Application of the forceps.*—The face being placed diagonally, the blades of the forceps should be introduced according to the rules applicable to these presentations. But here, as in the first direct presentation, the head should be grasped in the direction of the occipito-frontal diameter. The accoucheur, therefore, after having brought the face to the first direct presentation, should proceed precisely according to the rules laid down for the management of that presentation.

### SECOND DIAGONAL PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead presents to the right cotyloid cavity, and the chin to the left sacro-iliac symphysis.

*Application of the forceps.*—The application of the forceps is precisely the same, as in the second diagonal presentation of the vertex; but, as in the preceding presentation, the head should be grasped in the direction of its occipito-frontal diameter.

The accoucheur, placing himself behind the instrument, brings the face to the first diagonal presentation, and proceeds according to the rules laid down for the management of that presentation.

### THIRD DIAGONAL PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead presents to the right sacro-iliac symphysis, and the chin to the left cotyloid cavity.

*Application of the forceps.*—The blades of the instrument should be applied according to the rules for the first diagonal presentation: but the head should be grasped in the direction of the occipito-mental diameter, and in order to accomplish this, it will be sufficient to elevate the handle of the forceps.

When the instrument is properly applied, the accoucheur should place himself behind it, and by bringing the face to the second direct presentation, he should proceed according to the rules for the management of that presentation.

### FOURTH DIAGONAL PRESENTATION OF THE FACE AT THE INFERIOR STRAIT.

*Principal relations.*—The forehead is directed towards the left sacro-iliac symphysis, and the chin towards the right cotyloid cavity.

*Application of the forceps.*—The forceps are applied in the same manner as in the second diagonal presentation, with the exception, that the head should be grasped in the direction of its occipito-mental diameter. This being done, the accoucheur should place himself behind the instrument, bring the face to the second direct presentation, and finish the labour in the same manner as in that presentation.

I. When the forehead presents directly to the left side of the pelvis, and the chin to the right, the accoucheur should conduct the labour as in the first and third diagonal presentations.

II. When the forehead corresponds directly to the right side of the pelvis and the chin to the left, the accoucheur should proceed in the same manner as in the second and fourth diagonal presentations.

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#### PRESENTATIONS OF THE FACE AT THE SUPERIOR STRAIT.

The face may present at the superior strait in the same directions as at the inferior.

The relations between the head and the pelvis being precisely the same as at the inferior strait, with the exception, that the parts are less engaged, we deem it altogether unnecessary to repeat them.

#### FIRST DIRECT PRESENTATION OF THE FACE AT THE SUPERIOR STRAIT.

*Application of the forceps.*—The forceps are applied precisely in the same manner as in the corresponding presentation of the vertex; and here, as at the inferior strait, the head should only be grasped in the direction of its occipito-frontal diameter.

The forceps being properly applied, the accoucheur places himself to one side, and by pushing the head a little above the superior strait, he should convert the presentation into the first or second diagonal presentation of the superior strait. This being done, he should proceed according to the



rules which we shall point out presently in speaking of the diagonal presentations.

## SECOND DIRECT PRESENTATION OF THE FACE AT THE SUPERIOR STRAIT.

*Application of the forceps.*—The forceps are applied in the same manner as in the corresponding presentation of the vertex. The head should be grasped in the direction of the occipito-mental diameter, and then, by pushing it a little above the superior strait, it should be brought to the third or fourth diagonal presentation. This being done, the labour is to be conducted upon the same principles as in those presentations.

## FIRST AND SECOND DIAGONAL PRESENTATIONS OF THE FACE AT THE SUPERIOR STRAIT.

*Application of the forceps.*—The forceps are applied in the same manner as in the corresponding presentations of the inferior strait; but the blades, and the hand which serves to guide them, must be carried farther up.

When the instrument is properly applied, the accoucheur should bring the face to the first or second diagonal presentation of the inferior strait, by inclining the forceps towards the corresponding thigh; which being done, he should proceed precisely in the same manner as in the presentation into which he has changed it.

## THIRD AND FOURTH DIAGONAL PRESENTATIONS OF THE FACE AT THE SUPERIOR STRAIT.

*Application of the forceps.*—The forceps are ap-

plied in the same manner as in the corresponding presentations of the inferior strait; only that the blades should be carried higher up. When the forceps are applied, the accoucheur brings the face to the inferior strait, and conducts the rest of the labour precisely in the same manner as in the presentations of the inferior strait.

I. When the forehead corresponds directly to the right or left side of the pelvis, the accoucheur should apply the forceps, and finish the labour exactly in the same manner as in the corresponding presentations of the inferior strait, taking always care, however, to bring the head first into the cavity of the pelvis.

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#### APPLICATION OF THE FORCEPS WHEN THE TRUNK HAS BEEN DELIVERED.

After the trunk has been delivered, the head may be arrested, either at the superior or at the inferior strait of the pelvis.

It may present at either strait in six principal positions, viz, in two direct and four diagonal.

In all these presentations, the principal relations between the head of the fœtus and the pelvis of the mother are the same as in the presentations of the vertex, only that, instead of the occiput, the chin presents first.

The presentations being alike, the forceps are to be applied in each case upon similar principles.

PRESENTATIONS OF THE HEAD AT THE INFERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

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FIRST DIRECT PRESENTATION OF THE HEAD AT THE INFERIOR STRAIT, WHEN THE TRUNK OF THE FŒTUS HAS BEEN DELIVERED.

*Principal relations.*—The occiput corresponds to the arch of the pubes, and the face to the hollow of the sacrum.

*Application of the forceps.*—An assistant being desired to elevate the trunk and arms of the fœtus, the accoucheur introduces the blades of the forceps below, so as to grasp the head in the direction of its occipito-frontal diameter. Then locking the instrument, he moves it from side to side, and delivers the head by turning the handle of the forceps upon the abdomen of the mother, at the same time that he firmly supports the perineum with the right hand.

SECOND DIRECT PRESENTATION OF THE HEAD AT THE INFERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

*Principal relations.*—The occiput is in the hollow of the sacrum, and the forehead under the arch of the pubes.

*Application of the forceps.*—In this presentation the forceps should be applied above, so as to grasp the head in the direction of its occipito-mental diameter.

An assistant is requested to support the trunk of the fœtus; and when the instrument is properly ap-

plied, the accoucheur firmly supports the perineum with one hand, while with the other he depresses the handle of the forceps, so as to disengage the face from below the pubes.

FIRST DIAGONAL PRESENTATION OF THE HEAD AT THE INFERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

*Principal relations.*—The occiput corresponds to the left cotyloid cavity, and the forehead to the right sacro-iliac symphysis.

*Application of the forceps.*—The foetus being elevated by an assistant, the blades of the forceps are introduced below, and then, bringing the head to the first direct presentation, the accoucheur proceeds in the same manner as in that presentation.

SECOND DIAGONAL PRESENTATION OF THE HEAD AT THE INFERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

*Principal relations.*—The occiput presents to the right cotyloid cavity, and the forehead to the left sacro-iliac symphysis.

*Application of the forceps.*—The forceps are introduced in the same manner as in the preceding presentation, and the management of the rest of the labour is exactly similar.



THIRD DIAGONAL PRESENTATION OF THE HEAD AT  
THE INFERIOR STRAIT, WHEN THE TRUNK HAS  
BEEN DELIVERED.

*Principal relations.*—The occiput presents to the right sacro-iliac symphysis, and the forehead to the left cotyloid cavity.

*Application of the forceps.*—In this presentation the blades of the forceps should be introduced above the fœtus, in order to grasp the head in the direction of its occipito-frontal diameter. The instrument being properly applied, the accoucheur should rotate the head so as to bring the face under the pubes, and the occiput in the hollow of the sacrum, and accomplish the delivery in the same manner as in the second direct presentation.

If the accoucheur experiences a great deal of difficulty in introducing the forceps above the fœtus, he should introduce them below, and proceed upon the principles that we shall point out presently in speaking of the diagonal presentations of the superior strait.

FOURTH DIAGONAL PRESENTATION OF THE HEAD AT  
THE INFERIOR STRAIT, WHEN THE TRUNK HAS  
BEEN DELIVERED.

*Principal relations.*—The occiput presents to the left sacro-iliac symphysis, and the forehead to the right cotyloid cavity.

*Application of the forceps.*—In this, as in the preceding presentation, the forceps should be applied above the fœtus, in order to grasp the head in the direction of its occipito-mental diameter. This

being done, the accoucheur should rotate the head, and finish the labour in the same manner as in the second direct presentation.

Should there be much difficulty in introducing the forceps above the fœtus, it ought then, as in the preceding presentation, to be introduced below.

I. When the occiput corresponds directly to the left side of the pelvis, and the forehead to the right, the forceps are to be applied in the same manner as in the first and third diagonal presentations.

II. When the head presents in an inverse direction, the accoucheur should proceed in the same manner as in the second and fourth diagonal presentations.

#### PRESENTATIONS OF THE HEAD AT THE SUPERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

The head of the fœtus may present in the same manner at the superior as at the inferior strait; and as its relations with the pelvis of the mother are the same, with the exception that the parts are less engaged, we shall not repeat them on the present occasion.

#### FIRST DIRECT PRESENTATION OF THE HEAD AT THE SUPERIOR STRAIT, WHEN THE TRUNK HAS BEEN DELIVERED.

*Application of the forceps.*—An assistant being requested to elevate the fœtus, the accoucheur introduces the blades below, and when they are properly applied, he pushes the head above the superior strait, and converts the presentation into the first or second diagonal presentation, accordingly as

he is placed to the right or left of the instrument. This being done, he draws the head into the inferior strait, and accomplishes the delivery in the same manner as in the presentations of the inferior strait.

SECOND DIRECT PRESENTATION OF THE HEAD AT  
THE SUPERIOR STRAIT, WHEN THE TRUNK HAS  
BEEN DELIVERED.

*Application of the forceps.*—In this presentation, although the face is in front, we ought, above all things, to apply the blades of the forceps below the foetus, in order that they may embrace the head in the direction of its occipito-frontal diameter. The head is to be pushed above the superior strait, and the presentation should be converted into the third or fourth diagonal; and then, by drawing it into the inferior strait, it should be rotated so as to bring it to the second direct presentation. This being done, the accoucheur should unlock the forceps, unless the pelvis be very large, or the head small, without, however, withdrawing them from the parts, and then, by elevating the right blade, and depressing the left, he should pass them over the trunk of the foetus. The forceps are again locked, and by this simple manœuvre, the head will be grasped in the direction of its occipito-mental diameter, and the rest of the delivery is to be accomplished in the same manner as in the second direct presentation.

FIRST AND SECOND DIAGONAL PRESENTATIONS OF  
THE HEAD AT THE SUPERIOR STRAIT, WHEN  
THE TRUNK HAS BEEN DELIVERED.

*Application of the forceps.*—The forceps should be applied in the same manner as in the corresponding presentations of the inferior strait; only that the blades, and the hand which guides them, are to be carried higher up.

The forceps being properly applied, the accoucheur places himself behind the instrument, and brings the head into the inferior strait, by inclining the handle towards the corresponding thigh. This being done, he rotates the head, and accomplishes the delivery precisely in the same manner as in the first direct presentation of the inferior strait.

THIRD AND FOURTH DIAGONAL PRESENTATIONS  
OF THE HEAD AT THE SUPERIOR STRAIT, WHEN  
THE TRUNK HAS BEEN DELIVERED.

*Application of the forceps.*—In these presentations it is absolutely necessary to introduce the blades of the forceps below the fœtus. When the instrument is properly applied, the head must be brought into the inferior strait, by inclining the handle towards the corresponding thigh, and then, by rotating it, the face will be brought under the pubes and the occiput in the hollow of the sacrum. This being done, the instrument is to be unlocked without removing it from the parts; and then, gliding the blades along the fœtus until they reach the head, they are to be locked above. By this manœuvre, the head will be embraced in the direction of



its longest diameter, and the rest of the labour is to be conducted upon the same principles as in the second direct presentation of the inferior strait.

I. When the occiput corresponds directly to either side of the pelvis, the accoucheur should introduce the forceps and conduct the labour precisely in the same manner as in the corresponding presentations of the inferior strait, taking care always to bring the head first into the cavity of the pelvis.

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#### RECAPITULATION OF THE DIFFERENT APPLICATIONS OF THE FORCEPS.

In whatever manner the head may present, whether by the vertex, by the face, or its base; and whether it be arrested at the inferior or at the superior strait, the rules to be observed in the application of the forceps are always the same.

When the instrument is properly applied, it ought to embrace the lateral parts of the head, in the direction of their length, in order that the occiput or the chin may always be delivered before any other part.

#### PRESENTATIONS OF THE INFERIOR STRAIT.

*Direct presentations.*—In all the direct presentations of the inferior strait, whatever may be the part of the head that presents, the left blade of the forceps should always be introduced first, with the left hand, and then the other with the right hand. The instrument should be locked in such a manner that its pivot shall correspond to the centre of the vulva; and then, placing himself to one side, the ac-

coucheur seizes the forceps with both hands, one of which is to be placed at the lower part of the handle, and the other upon the upper edge of the blade, near the external parts. In this manner, he moves the head from side to side, and delivers it by turning the instrument towards the abdomen of the mother, if the face present downwards, and by firmly depressing it if it present upwards. When the head is about to pass, the hand, which is near the external parts, should be applied against the perineum, which is to be firmly supported.

*Diagonal presentations.*—In all the diagonal presentations of the inferior strait, whatever may be the part of the head that presents, the accoucheur is guided, in the application of the forceps, by the relation of the occiput or the forehead with the cotyloid cavities of the pelvis.

Whenever the occiput or forehead corresponds to the left cotyloid cavity, the blades of the forceps are to be introduced, with the right hand, taking care always to commence the introduction with the right blade.

Whenever, on the contrary, the occiput or forehead corresponds to the right cotyloid cavity, the blades are to be introduced with the left hand, taking care always to begin with the left blade of the instrument.

When the instrument is locked, the accoucheur places himself behind it, and then, taking the handle in one hand, and applying the other upon the upper part of the blades near the genital parts, he rotates the head, and terminates the labour either in the first or second direct presentation, accordingly as the occiput or the forehead is under the arch of the pubes.

I. When the occiput corresponds directly to the left side of the pelvis, the labour is to be conducted in the same manner as in the first diagonal presentation.

II. When it corresponds directly to the right side of the pelvis, the labour should be conducted upon the same principles as in the second diagonal presentation.

#### PRESENTATIONS OF THE SUPERIOR STRAIT.

*Direct presentations.*—In all the direct presentations of the superior strait, whatever may be the part of the head that presents, the forceps should be applied in the same manner as in the inferior strait, only that the blades, and the hand which directs them, are to be carried farther up. When the instrument is properly applied, the accoucheur applies one hand upon the upper part of the handle, and the other on the lower part of the blades, and carrying his index finger as far as the head of the foetus, he moves it from side to side, and places it in one of the diagonal presentations of the superior strait. This being done, he draws it into the inferior strait, and brings it to one of the diagonal presentations, by inclining the handle of the forceps towards the corresponding thigh, and then finishes the labour in the same manner as in the presentations of the inferior strait.

*Diagonal presentations.*—In all the diagonal presentations of the superior strait, whatever may be the part of the head that presents, the forceps are to be introduced in the same manner as in the presentations of the inferior strait, only that the blades, and the hand which guides them, must be carried

farther in. When the instrument is locked, the accoucheur should always place himself behind it, and apply one hand upon the upper part of the handle, and the other on the lower part of the blades, in such a manner as to carry the index finger within the parts. This being done, he should bring the head to one of the diagonal presentations of the inferior strait, and conduct the labour in the same manner as in the presentations of that strait.

I. When the occiput corresponds directly to the left side of the pelvis, the labour is to be conducted in the same manner as in the first diagonal presentation.

II. When it corresponds directly to the right side of the pelvis, it is to be conducted upon the same principles as in the second diagonal presentation.

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### OF THE LEVER.

By this name, says professor Desormeaux, accoucheurs designate an instrument which is intended by its inventors to act as a lever upon the head of the foetus, and to force it through the canal of the pelvis and the organs of generation.

The origin of this instrument is still involved in obscurity, though it has most generally been considered as the invention of Roger Roonhuisen.

The lever that is used at the present day, resembles one of the blades of the forceps.

The blade of the lever is formed in the same manner as those of the forceps. It has a fenestra, and is curved in such a manner as to have a concavity on one side which corresponds to the convexity of the head of the foetus, and a convexity on



the other which corresponds to the concavity of the pelvis. The handle of the instrument is made of wood.

*Remark.*—Instead of the lever, accoucheurs often make use of one of the blades of the forceps; though, as has been justly observed by Professor Desormeaux, the lever, properly so called, is preferable when it can be made to act directly upon the occiput.

If we use a blade of the forceps, we should always take care, in the diagonal presentations, to take the right when the occiput is to the right of the pelvis, and the left when it is to the left of the pelvis. In the direct presentations, we may use either blade; but we should, in every instance, introduce the one which we employ with the hand that corresponds to it by name.

*Use of the lever.*—The use of the lever is generally limited to correcting the position of the occiput, and to draw it in such a manner as to bring it to the centre of the pelvis, when it is turned upon the back of the infant, as happens in the presentations of the face.

The lever may be used in the presentations of the inferior and in those of the superior strait of the pelvis. We shall point out the method of operating in each particular case.

#### PRESENTATIONS OF THE FACE AT THE INFERIOR STRAIT.

##### FIRST DIRECT PRESENTATION.

The occiput is turned backwards and corresponds to the symphysis pubis.

*Application of the lever.*—One of the hands be-

ing introduced into the vagina, the lever is to be carried upon the side of the head, and by depressing its handle, it is applied upon the occiput by means of the fingers. When the instrument is properly secured, its handle is to be elevated and grasped with one hand, while the other is applied upon its upper part, near the symphysis pubis. This being done, the accoucheur depresses the handle of the instrument by drawing it towards himself, while with the other hand he presses the head firmly from before backwards.

If the accoucheur does not succeed in this manner in correcting the position of the occiput, he should, at the same time that he acts upon the lever, push the face backwards with some of the fingers placed near the symphysis pubis. When the head has assumed its natural position, the delivery is generally accomplished by the efforts of nature, or if circumstances demand it, he must have recourse to the forceps.

#### SECOND DIRECT PRESENTATION.

The occiput corresponds to the sacrum.

*Application of the lever.*—In this presentation we ought to glide the lever in front of the sacrum as far as the occiput, and, after it is properly applied, it should be seized with one hand near the perineum, while with the other we pull at the handle of the instrument and gradually elevate it.

If there be much difficulty in rectifying the position of the occiput, we should push at the face with some of the fingers of the hand placed near the parts.

*Remark.*—In this presentation, it would be preferable to use the forceps, since the head may be

embraced in the direction of its length, and the chin made to pass first.

#### FIRST AND SECOND DIAGONAL PRESENTATIONS.

In the first, the occiput is turned backwards and corresponds to the left cotyloid cavity, and in the second, it is turned backwards and corresponds to the right cotyloid cavity.

*Application of the lever.*—One of the hands being introduced into the parts, the lever is to be carried upon the side of the head, and then upon the occiput, by depressing the handle of the instrument in the same manner as in the first direct presentation.

When the position of the head is rectified, the delivery is to be left to the efforts of nature, or if the case require it, we must apply the forceps.

#### THIRD AND FOURTH DIAGONAL PRESENTATIONS.

In the first presentation, the occiput is turned backwards and corresponds to the right sacro-iliac symphysis, and in the second, to the left sacro-iliac symphysis.

*Application of the lever.*—In these presentations the accoucheur introduces the lever, and proceeds precisely in the same manner as in the second direct presentation.

*Remark.*—In these last two presentations the forceps are preferable to the lever, since it is practicable to grasp the head in the direction of its occipito-mental diameter, and to disengage the chin first.

I. When the occiput is turned backwards and

corresponds directly to the right or left side of the pelvis, we must proceed upon the same principles as in the third and fourth diagonal presentations.

#### PRESENTATIONS OF THE FACE AT THE SUPERIOR STRAIT.

##### FIRST AND SECOND DIRECT PRESENTATIONS.

In these presentations the relations of the child with the pelvis of the mother, are the same as in those of the inferior strait, only that the head is less engaged.

*Application of the lever.*—The application of the lever is effected precisely in the same manner as in the presentations of the inferior strait, but in proportion as we depress the occiput, we should endeavour to bring the head to a diagonal presentation.

##### DIAGONAL PRESENTATIONS.

In all these presentations the relations of the fœtus with the pelvis of the mother are the same as in the corresponding presentations of the inferior strait, only that the head is less engaged.

*Application of the lever.*—In all the diagonal presentations of the face at the superior strait, we should introduce the lever and proceed in the same manner as in the corresponding presentations of the inferior strait.

I. When the occiput corresponds directly to the right or left side of the pelvis, we should conduct the delivery in the same manner as in the third and fourth diagonal presentations.



*Remark.*—As the lever can be used with less advantage in the presentations of the superior than in those of the inferior strait, many accoucheurs prefer the forceps; though Professor Desormeaux has employed it successfully in two cases, where the head was situated transversely, and could not be properly embraced by the forceps.

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### OF THE BLUNT HOOKS.

The blunt hooks which are employed for the extraction of the fœtus have various forms, some being curved, while others form almost a right angle with the principal blade of the instrument. The handles of all these hooks are generally of wood.

*Remark.*—The two blunt hooks which terminate the handle of the forceps; may, in all cases, be used instead of these single hooks, since they have precisely the same form.

*Use of the blunt hooks.*—The curved hook, with an acute angle, is intended to be applied in the hollow of the axilla, in cases where the shoulders are retained within the pelvis, and can not be extracted by the fingers.

This may also be used in extracting the knees when they present at the inferior strait.

It may also be applied in the mouth in order to extract the head after the turning of a dead fœtus.

The hook, which forms a right angle with the principal blade of the instrument, is intended to be applied exclusively in the fold of the groin, in the presentations of the breech of the inferior strait. Professor Desormeaux is of opinion, that in the greatest number of cases where the use of the blunt

hook is indicated, the fingers may be employed with much more advantage.

*Introduction of the blunt hook.*—There are no very precise rules for the introduction of this instrument, and the only precaution that is necessary to be observed, is, to guide it with a finger, in order that we may be aware of the disposition of the part, where we wish to apply it. When the hook is introduced so as to embrace an extremity, it should always be seized with the hand that corresponds by name to that extremity; and in extracting the foetus, we should always take care to draw it in the different directions of the axes of the pelvis.

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### SECTION III.

OF LABOURS WHICH MAY BE TERMINATED BY THE  
USE OF CUTTING INSTRUMENTS.

#### *Particular causes of these kinds of Labour.*

Amongst the labours which demand the employment of cutting instruments, some are owing to diseases, or mal-conformations of the foetus, which may render its volume so considerable that delivery can not be accomplished without a previous operation; while others, on the contrary, are owing to a narrowness of the pelvis of the mother, and to certain mal-conformations of her genital parts.

Before entering upon an examination of what relates to these different kinds of labour, we shall say something of the instruments which are employed for their accomplishment.

## OF THE PERFORATOR.

The perforator is an instrument, by the aid of which we may divide the parietes of the cranium. Mauriceau, Smellie, Deventer and others, have invented different kinds of perforators; but all these instruments may be superseded by a common knife, a bistoury, a trephine perforator, or by a kind of blade contained in the blade of the forceps, whose handle is curved to a right angle.

*Choice of the perforator.*—The knife or the bistoury is preferable when we wish to make a large angular opening into the cranium, for the purpose of extracting the brain.

The trephine perforator may be used with much advantage where we wish merely to operate at a single point, in order to give passage to extravasated fluids, as in cases of hydrocephalus.

*Place of incision.*—When the head presents first, we should perforate the cranium at the superior fontanelle, or at the sagittal suture.

In case the head does not present until after the delivery of the trunk, we should perforate it in the occipital region, at the lambdoidal suture, or at the coronal, if it be within reach.

*Introduction of the perforator.*—The instrument, whatever it be, should always be guided by several fingers introduced into the parts of the woman.

## OF THE CROTCHET.

The ancients invented several kinds of crotchets, but all may be advantageously superseded by the one

that is attached to the handle of the forceps. Indeed, this crotchet has all the desired advantages, and is not attended with the inconveniences of those that were formerly in use.

*Use of the crotchet.*—As the crotchet does not diminish the volume of the parts upon which it is applied, it is evident that it should be employed only in those cases where these parts do not exceed the size of the pelvis of the mother.

*Place of application.*—The crotchet may be applied upon every part that presents resistance, as the head, the chest, the pelvis, &c.; but of all these parts the head is the one that demands its most frequent use.

When we use the crotchet for the purpose of extracting the head, we ought always to apply it in such a manner that it may pass by one of the extremities of its longest diameter. Thus, when the head presents first, the crotchet should be applied upon the occiput, and when it does not present until after the trunk has passed, it should be applied either upon the upper jaw or the forehead, as may be most convenient.

*Application of the crotchet.*—Whenever the accoucheur introduces a crotchet into the uterus, says Professor Desormeaux, he ought to direct it with his fingers, so as to prevent it from injuring the parts of the mother. This being done, he should proceed precisely in the same manner as in the introduction of a blade of the forceps. Thus, one of the hands being in the vagina, or as high up as the uterus, the crotchet is to be glided upon it until it has arrived upon the head, when it is to be inclined so as to penetrate its thickness.



## OF EMBRYOTOMY.

Embryotomy is the operation of dividing the fœtus in utero, in order to extract it piece-meal. As the instruments which are employed in performing this operation do not deserve a particular description, we shall confine our attention to pointing out their use.

## OF LABOURS WHICH REQUIRE THE USE OF CUTTING INSTRUMENTS UPON THE FŒTUS.

*Causes.*—The fœtus may be affected by diseases or mal-conformations, which may render it so large that the delivery can not be accomplished without the aid of cutting instruments. The most frequent of these diseases are hydrocephalus, hydrothorax and ascites. The most ordinary mal-conformations are preternatural adhesions between the legs, and the presence of certain fungous or steatomatus tumours, on certain parts of the fœtus.

## OF HYDROCEPHALUS.

*Principal signs.*—When the disease has been carried to such an extent as to oblige us to employ cutting instruments, we may distinguish it by the great size of the fontanelles and sutures, by the general softness of the head, by evident symptoms of fluctuation, &c.

*Indications to be fulfilled.*—Whether the fœtus be dead or living, we ought to open the cranium, in order to discharge the fluid which it contains, and to reduce it in such a manner that we may be enabled to accomplish the delivery by the natural

passages. It is true, there have been some accoucheurs, who have had the boldness to say that we ought to operate on the mother in case the foetus be alive; but is it not sheer ignorance and presumption thus to hazard the life of a mother in order to save that of an infant, which is doomed to certain destruction?

When the cranium is opened, the serosity escapes, the head assumes its original shape, and the delivery may be effected by the efforts of nature, or if it be necessary, we may have recourse to the crotchet, or the forceps.

#### OF HYDROTHORAX AND ASCITES.

*Principal signs.*—The size and fluctuation are the only signs by which we can distinguish hydrothorax and ascites.

*Indications to be fulfilled.*—The fluid should be discharged by a puncture made with a trephine perforator; and then, if the natural efforts are not sufficient to accomplish the delivery, we ought to have recourse to the forceps or the crotchets.

#### OF DETRUNCATION.

When the head is the only part that remains in the uterus, we should endeavour, by means of the hand, to bring it to a proper position, and then to extract it with the fingers applied upon the inferior jaw.

If this method of proceeding be unsuccessful, and if the size of the head exceed that of the pelvis of the mother, we should fix it at the entrance of the superior strait, by means of one of the hands introduced into the uterus, and perforate the cranium so as to let

out its contents, and to terminate the labour by means of the crotchet. Professor Desormeaux remarks that in this case, it is to be feared that on account of the rolling motion of the head, in consequence of the tractions which are exerted upon it, the crotchet might slip, and in order, therefore, to avoid this accident, he advises us to give a preference to the forceps.

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#### OF THE EXTRACTION OF THE TRUNK.

When the trunk alone is retained in the uterus, it may be extracted in various ways; first, by applying the blunt hooks in the hollow of the axillæ; secondly, by first disengaging the arms in order to push them up; thirdly, by applying the crotchet upon the upper part of the vertebral column, or between two ribs: the first of these methods is preferred by Professor Desormeaux, because he fears that the crotchet may slip, in consequence of the brittleness of the ribs; fourthly, by turning it so as to deliver by the feet.

In whatever manner we operate, we should always take care to place the longest diameters of the fœtus in relation with those of the mother, and to withdraw it in the directions of the axes of the pelvis.

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#### OF THE EXTRACTION OF MONSTERS.

1. There may be cases in which two living twins may be united together at certain points of their surface merely by means of the integuments. In

these cases they ought to be separated by means of a cutting instrument, and should then be delivered according to the general rules of the obstetric art.

2. There may be instances in which the two twins may be united together at the vertex of the head; examples of which have been related by Baudelocque and M. Caperon, on the authority of Ambrose Paré. In these cases, the one should be delivered by the feet, and the other, which will necessarily present by the head, if it should remain too long in the pelvis, ought to be extracted by means of the forceps.

3. When two heads belong to the same trunk and present at the same time at the superior strait of the pelvis, we ought, according to Doctor Gardien, to diminish their volume by opening them, in order to extract them by means of the crotchets.

4. In case there be two trunks with but one head, and both presenting at the superior strait, it is evident, that they ought to be separated, in order that they may be extracted one after the other.

5. In case there be large tumours upon certain parts of the surface of the foetus, which present an obstacle to the termination of the labour, we ought, according to the advice of the greatest number of accoucheurs, either to reduce their size, or to remove them, and not to perform any operation on the mother.

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#### OF LABOURS WHICH DEMAND THE EMPLOYMENT OF CUTTING INSTRUMENTS UPON THE MOTHER.

*General causes.*—These are, according to Professor Baudelocque; 1st, mal-conformations of the



genital parts of the mother; 2d, mal-conformation of the pelvis; 3d; rupture of the uterus and the vagina; and 4th, extra-uterine pregnancies.

#### OF MAL-CONFORMATIONS OF THE SOFT PARTS.

The mal-conformations of the soft parts may be either natural or accidental. "In the first case," says Professor Baudelocque, "the defects consist in the agglutination of the labia externa; in the narrowness of the entrance of the vagina, in consequence of the form and rigidity of the hymen; in the smallness of this canal, or the membranous intersections which occur there; in the imperfect obliteration of the cervix uteri; and in short, in a complete want of all the parts which constitute the vulva.

"The accidental mal-conformations of all these parts may be owing to the presence of tumours, or to some ulcerations which may give rise to preternatural adhesions."

#### *Indications to be fulfilled in these different mal-conformations.*

1. We may, observes the same author, without much danger to the mother, and without experiencing great difficulties, separate the labia externa, when they are united, as well as the hymen, when it obstructs the delivery, and the septa which are sometimes found in the interior of the vagina, or the cervix uteri, and the bands which prevent the dilatation of that canal.

2. When the orifice of the uterus is too narrow or completely obliterated; when it is schirrous, or as it were cartilaginous, we ought to make incisions

into it in different directions with a bistoury, guarded with a piece of linen to within half an inch of its point, and guided upon the finger.

3. When the os externum is imperforate, or the vulva be entirely wanting, we ought to make an incision in the direction of the raphe, extending from the symphysis pubis to within an inch and a half of the fore part of the anus.

4. Œdema of the genital parts may be treated by scarifications, which should be made at the inferior and internal part of the labia pudendi. By this means, the parts will be disgorged and the passage become free.

5. The varicose tumours, which are sometimes developed in the thickness of the parts of generation, often acquire a very considerable size, and, though they do not impede the delivery of the child, they may break and give rise to considerable sanguineous infiltrations. To avoid this accident, accoucheurs generally advise us to open some of the exterior ones, and to discharge their contents.

6. When the external genital parts are the seat of a large abscess, the pus should be discharged by means of an incision.

7. The vagina is sometimes filled with polypi, or schirrous tumours: when these are pedunculous, it is generally easy to free the woman, but when they have a large base it will sometimes be preferable to perform the Cæsarian operation.

8. The bladder may contain a large calculus. If we are called in time, we should push it up and keep it above the superior strait, until the head be delivered; but if the stone forms a tumour at the vulva and the head of the fœtus remains a long time in the cavity of the pelvis, we ought, above all things,

to make an incision into the vagina and the bladder in order to extract the calculus and to accomplish the delivery.

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#### OF THE MAL-CONFORMATIONS OF THE PELVIS OF THE MOTHER, AND OF THEIR EFFECTS UPON DELIVERY.

Every part of the pelvis of the mother may be in a state of mal-conformation; but as the obstacles to the termination of the labour most frequently occur at the superior strait, in the direction of its antero-posterior diameter, it is upon the different degrees of extent of this diameter that we must base the mode of termination applicable to each kind of labour. In this article, however, we shall treat only of those cases which require the employment of cutting instruments upon the mother, having already treated of those which demand their application upon the fœtus.

#### PRINCIPAL DEGREES OF DEFORMITY OF THE ANTERO-POSTERIOR DIAMETER.—INDICATIONS WHICH THEY PRESENT.

*Natural extent of the antero-posterior diameter four inches.*

**FIRST DEGREE OF DEFORMITY.**—*The antero-posterior diameter being from four inches to three and a half.*

In the first degree of deformity it may be possible to accomplish the delivery by the natural process,

since the head of the foetus has only an extent from one parietal protuberance to the other, of from three inches and a quarter to three inches and a half.

**SECOND DEGREE OF DEFORMITY.**—*The antero-posterior diameter being from three inches and a half to three inches.*

In the second degree of deformity, it will be impossible to accomplish the delivery by the natural efforts; but it may be effected successfully by means of the forceps. The turning of the foetus, which has been proposed by some accoucheurs, can not be attended with the same advantages, and it may give rise to serious accidents, such as the distention of the vertebral column, the luxation of the head, destruction, &c.

**THIRD DEGREE OF DEFORMITY.**—*The antero-posterior diameter being from three inches to two inches and a half.*

In this degree of deformity it would be inconvenient to apply the forceps. If the infant be living, we may perform the operation of symphysiotomy, and if it be dead, we must open the cranium.

**FOURTH DEGREE OF DEFORMITY.**—*The antero-posterior diameter being from two inches and a half to two inches.*

In deformities of this kind, it is absolutely necessary, if the child be alive, to extract it by the Cæsarian operation. If the infant be dead, however, we



should have recourse to the operation of embryotomy.

**FIFTH DEGREE OF DEFORMITY.**—*The antero-posterior diameter being less than two inches.*

Whether the foetus be alive or dead, we ought, above all things, to perform the Cæsarian operation; for, in this degree of deformity, the dismemberment of the infant in utero would be attended with more danger to the mother, than even the Cæsarian operation itself.

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#### OF SYMPHYSIOTOMY.

*Definition.*—Symphysiotomy is the name of the operation for dividing the fibro-cartilage which connects the bones of the pubes.

*Necessary instruments.*—A sound and a bistoury are the only instruments that are required for the performance of this operation. The bistoury should have a convex cutting edge and a blunt point.

*Time when the operation should be performed.*—The operation of symphysiotomy should be performed as soon as the neck of the uterus is sufficiently dilated, to enable us to introduce the hand, and while the pains are sufficiently strong to expel the foetus.

*Position of the woman.*—The woman is to be placed upon the edge of the bed, or upon a table of convenient height, her breech must be raised by means of a firm pillow, and her thighs are to be flexed upon the pelvis and somewhat separated from

each other. The legs should be supported upon two chairs.

*Position and duty of the assistants.*—Two assistants should be placed on the outside of the inferior extremities, which they are requested to maintain in the position which we have just indicated. When the operation is nearly completed, they ought to be particularly careful, to support the thighs, in order that the separation of the pubes may not take place too suddenly. A third assistant is desired to hand the instruments to the operator, and to afford him such aid as he may require.

*Operation.*—Before we commence the operation, we should shave the pubes, and introduce the sound into the bladder, in order to evacuate the urine, and to depress the urethra downwards and to the right of the woman, for the purpose of protecting it from the instrument. An assistant should be requested to hold the sound.

This being done, the operator draws the integuments towards the umbilicus, and commences his incision at the superior margin of the symphysis pubis, and carries it as far as the clitoris, without interfering with the anterior commissure of the vulva. Then, carrying his bistoury slowly from above downwards, or according to Plenck, from before backwards, he divides the fibro-cartilage. If the division of the cartilage be effected by carrying the instrument from above downwards, the operator should take care to protect its point with the nail of the left index finger, in order to avoid interfering with the bladder or the urethra. When the section of the fibro-cartilage is completed, he must divide the superior and inferior ligaments, and gradually separate the pubes, in order to avoid injuring the

sacro-iliac symphyses. When the operation is completed, the labour is to be left to the efforts of nature, or if the circumstances of the case demand it, we may terminate it by the aid of the hand or the forceps.

As soon as the delivery is accomplished, the bones should be approximated, and maintained in immediate contact by means of a bandage applied around the pelvis. Experience has proved, that a double roller of cloth or flannel, from six to seven inches wide, and furnished at one of its extremities with a buckle, and at the other with a strap, is the most convenient means that can be employed.

The woman should observe the most perfect rest, until the parts are completely consolidated, and, although the bones are generally re-united at the end of a month or six weeks, she ought not to be permitted to walk about, before the lapse of two months.

As to the exterior wound, it will readily heal by union of the first intention, and by means of simple dressings. Alphonso Leroy advises us, however, to dress the wound with a piece of lint, dipped in a mixture of brandy and the white of an egg.

#### OF THE EXTENT TO WHICH THE PUBES MAY BE SEPARATED WITHOUT LESION OF THE SACRO-ILIAC SYMPHYSES.

In general the separation of the pubes may be carried to an extent of two inches without rupture of the sacro-iliac symphyses; but when carried beyond this, it will, according to the experiments of Baudelocque, produce the most serious accidents. The most frequent of these are inflammation, ab-

scesses, &c. If we may credit, however, M. Gardien, who has founded his assertion upon the experiments of MM. Giraud and Ansiaux, the separation of the pubes may be carried to an extent of four inches, without any lesion on the part of the posterior articulations of the pelvis.

#### OF THE BENEFITS OF THE OPERATION.

	Lines.
If the pubes be separated to the extent of one inch, it will give an increase to the antero-posterior diameter of - - - - -	2
Two inches will give - - - - -	4
Two and a half, according to Baudelocque,	6
Three inches, according to Giraud, - -	8
Four inches, according to the same author,	12

#### RESULTS OF THE OPERATION, CONSIDERED WITH RESPECT TO THE MOTHER AND THE INFANT.

Upon 41 women, says Professor Baudelocque, upon whom the operation has been performed, 14 died, and 27 only survived. Of the 41 infants, 13 were alive, and 28 dead.

Amongst the women that died after the operation, some appeared to have fallen victims in consequence of the operation having been performed at too late a period; and many, amongst those that survived, had had one or more children—a fact which proves, at least, that there was no great deformity of their pelves.

In summing up the results of the above observations, it will appear that symphysiotomy is a serious operation, and that it should be performed only



in those instances where the necessity of the case absolutely demands it.

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#### OF GASTRO-HYSTEROTOMY, OR THE CÆSARIAN OPERATION.

*Definition.*—Professor Desormeaux defines the Cæsarian operation to be an incision made in the parietes of the abdomen and in those of the uterus for the purpose of extracting the foetus.

The origin of the Cæsarian operation is lost in the obscurities of time, though it may be referred to a very early period. It was for a long time performed only upon the dead subject, and was for the first time practised upon a living female in 1500.

*Instruments.*—The instruments which are necessary in this operation are, two bistouries, one of the ordinary kind, and the other straight and probe-pointed, a pair of pincers, with needles and ligatures. There should also be at hand, a fine sponge, compresses, lint, bandages, &c.

*Time of election for performing the operation.*—The most ancient method consists in making an incision upon one side of the abdomen, though the preference is given to the one to which the fundus uteri is inclined. Accoucheurs are not agreed with regard to the direction of the incision; some advise to make it obliquely in the direction of a line, extending from the cartilaginous extremity of the third sternal rib to the symphysis pubis; others to make it semi-lunar; while Levret advises us to make it parallel to the external margin of the rectus muscle, and Lauerjat to give it a transverse direction.

*Inconveniences of the Lateral Method.*

The lateral method is inconvenient: 1st, because we are obliged to divide three planes of muscles, which, in consequence of their different directions, present great difficulties to the process of cicatrization; 2d, in making the incision we are obliged to divide some of the branches of the epigastric artery, and some of the principal arteries of the uterus; and 3d, the fibres of the uterus being divided obliquely or transversely, can not contract without opening the wound and without giving rise, consequently, to an effusion of the lochia into the cavity of the abdomen.

Aware of the inconveniences of the lateral method, the moderns, such as Mauriceau, Platner, Solayrès, and others, have preferred to make the incision upon the linea alba.

This method also has its inconveniences; but as it is generally preferred, we shall describe the different steps of the operation.

*Proper time for performing the operation.—*

The Cæsarian operation, says Professor Desormeaux, has a time of necessity and a time of election; of necessity, when we are called in after a more or less protracted labour, and when the life of the mother or of the infant would be endangered by longer delay; and of election, when we have time, during the course of pregnancy, to convince ourselves of the obstacles which may impede the delivery, and to fix upon the mode of conduct that ought to be pursued. In these cases, accoucheurs are generally agreed, that, in order that the labour may be well conducted, we should take care that

the cervix uteri be sufficiently dilated to give passage to the blood which is effused upon the surface of the uterus, to the coagula which may form in its cavity and to the lochia. Notwithstanding this, the operation should always be performed before the evacuation of the waters has taken place, in order that the uterus may contract and reduce the incisions to a very small extent, and in order also that we may be less liable to wound the fœtus.

*Preliminary measures.*—If the woman be robust and plethoric, she ought to be cautiously bled: but if she be excessively nervous and irritable, she should be placed in the bath, and take some anti-spasmodic potions.

Previously to commencing the operation, we ought to shave the pubes, and to empty the bladder and the rectum.

*Position of the woman.*—The woman is to be placed on the side of the bed, upon her back, her head and chest should be somewhat elevated, and her legs should be stretched during the incision, and demi-flexed during the extraction of the infant. Her loins should be raised by a pillow in order to render the abdomen more prominent.

*Position of the assistants.*—Two assistants are requested to steady the uterus, in order to keep away the intestines from the place where the incision is to be made. Other assistants are requested to hand the instruments to the operator and to afford him such aid as he may require; while others again, are charged with keeping the patient in her proper position.

*Operation.*—The accoucheur being armed with a convex bistoury, makes an incision in the direction of the linea alba, which, according to Professor



Baudelocque, ought to extend from the umbilicus, or above it, to within about an inch and a half of the symphysis pubis. Professor Desormeaux observes that when the incision is commenced above the umbilicus, the bistoury should be carried to the left of that cicatrix.

In carrying the incision above the umbilicus, it will be practicable to open the uterus at its most elevated part, and thereby to prevent the effusion of the lochia into the cavity of the abdomen. This first incision should extend merely through the skin and the subcutaneous cellular tissue. The linea alba is then to be cautiously divided towards its inferior part; and, by means of the probe-pointed bistoury carried upon the left index finger, the incision is to be continued from below upwards as far as the superior angle of the wound in the integuments. The peritoneum now alone remains to be divided, which should be done with the same caution and precisely in the same manner.

The parietes of the abdomen being divided, one of the assistants, who steady the uterus, should depress that organ as low down as possible, in order to bring its fundus to the superior angle of the wound in the parietes of the abdomen. This being done, the operator makes an incision into the anterior paries of the uterus to within about one inch of the inferior angle of the wound in the abdomen. This incision should be about six inches in length, and ought to embrace exclusively the parietes of the organ. It is to be commenced with the convex, and finished with the probe-pointed bistoury, which is to be carried from within outwards, and from above downwards. The membranes should now be cau-



tiously divided, and precisely in the same manner as the parietes of the uterus.

If the placenta correspond to the opening in the uterus, the operator ought, according to the advice of Professor Baudelocque, to detach it, and pierce the membranes near its circumference. But, as professor Desormeaux observes, it is impossible to know beforehand the place where this body is inserted, unless the new method of auscultation by M. de Kergaradec may prove to be of some utility: when this place is known, it should be avoided.

When the operation is completed, the operator should seize the feet, and extract the foetus exactly in the same manner as in a case of natural labour.

If the head presents naturally at the wound of the uterus, and if it can not be expelled by the contractions of that organ, its escape should be favoured by pressing slightly upon the sides of the abdomen, at some distance from the incision, or by insinuating the fingers under the angle of the lower jaw. We should proceed in the same manner, in case the breech presents at the incision.

The afterbirths may be delivered through the wound by the natural efforts, or they may be extracted by pulling at the umbilical cord, or what is still better, by grasping them with the fingers, in order that they may present less volume.

After the delivery of the afterbirths, the uterus should be freed of the coagula of blood which it contains, by passing a finger through the os tincæ, or by throwing up some tepid injections.

If the uterus be effected with inertia, or any manifest hemorrhage, we should induce it to contract by external pressure, by stimulating the edges

of the wound with the fingers, and by washing them with a mixture of vinegar and water. Injections of cold water, of vinegar and water, or even of pure vinegar, should also be thrown into the interior of the organ.

### *Treatment after the Operation.*

The treatment of the woman, after the Cæsarian operation, may be divided into local and general.

*Local treatment.*—The local treatment consists in covering the wound with proper dressings; but we should take care, above all things, to free the cavity of the abdomen from the blood and the waters that may have been effused into it. To effect this, it will be sufficient to put the woman in a proper position, and to make gentle pressure upon the sides of the abdomen, or to throw up tepid injections.

The wound in the uterus will be reduced to a very small extent by the contraction of that organ, and will require no attention.

As to the exterior wound, we are advised by Professor Desormeaux to unite it by means of two or three sutures, taking care to leave a small opening towards its inferior extremity for the passage of the fluids which may have been extravasated into the abdomen. Some even put a piece of linen into this opening in order to absorb these fluids. Baudelocque embraces the advice of Desormeaux, and advises us to place a piece of linen in the cervix uteri, in order to favour the escape of the lochia by the natural passages.

The use of the suture has not received general approbation. M. Capuron regards it as injurious, and as another cause of peritoneal inflammation; and as

perfectly useless, because the distention of the peritoneum, which is wont to occur, has always a tendency to relax the points of the sutures, even so much so as sometimes to oblige us to cut them. Accoucheurs, therefore, have proposed the use of strips of adhesive plaster, or the employment of the uniting bandage; but as M. Desormeaux observes, these means are insufficient to keep the lips of so large a wound in contact, on account of the softness and flaccidity of the parietes of the abdomen.

*Dressing.*—The whole dressing consists in placing a long compress along each side of the wound, and in covering it with a piece of linen, a dossil of lint and square compresses. These must be supported by means of a bandage carried around the abdomen.

The dressing ought to be removed several times during the course of the first twenty-four hours, and afterwards once or twice a day, according to the circumstances of the case, and accordingly as there may be suspicion of extravasation.

If the uterus contract any adhesions to the edges of the wound, we ought, according to the advice of Bacqua, MM. Capuron, Gardien, and others, to carefully separate them; for if this be neglected, the fluids which have been extravasated into the abdomen will be retained, and the woman will be exposed to severe twitching pains in the uterus, to hemorrhages, &c. &c.

*General treatment.*—The general treatment after the Cæsarian operation should be the same as in every other grand operation in surgery. Thus, the patient should be confined to the most perfect rest, her diet should consist of veal and chicken broths, barley water, herb teas, &c.; her bowels should be



freely opened by mild clysters, and if the symptoms of the disease require it, she should be repeatedly bled.

The woman ought to nurse her child as soon as possible, or at least to suckle it, during the first weeks, in order, as Professor Baudelocque observes, to invite the milk to the breasts, to divert it from the uterus, and to dry up more readily its secretions.

As soon as the wound is completely healed, the woman should wear a bandage around her abdomen, in order to prevent consecutive herniæ, which sometimes acquire a very considerable size.

#### RESULTS OF THE CÆSARIAN OPERATION, CONSIDERED WITH RESPECT TO THE MOTHER AND THE INFANT.

*With respect to the mother.*—The most frequent causes which render the Cæsarian operation fatal to the mother, are, inflammation of the uterus, of the peritoneum and intestines, suppuration, gangrene, and extravasations into the abdomen. Notwithstanding these causes, authors have related a great number of successful cases, and Baudelocque observes, that out of one hundred and eleven women, upon whom the operation was performed, forty-eight survived.

*With respect to the infant.*—The Cæsarian operation is the mildest and safest means that can be employed for the extraction of the infant; provided, however, that it sustains no injury during the performance of the operation.



OF THE RUPTURE OF THE UTERUS AND THE VAGINA,  
CONSIDERED WITH RESPECT TO DELIVERY.

When the uterus is ruptured during labour, the foetus most frequently passes, either in part or in whole, into the cavity of the abdomen. We shall only treat, on the present occasion, of those cases in which the foetus, not being able to be delivered by the natural passages, the accoucheur is obliged to employ cutting instruments upon the mother. These cases may be reduced to the following:

1st. Where nothing but the head of the foetus has passed through the opening, and the uterus is firmly contracted upon the neck of the infant.

2d. Where the head and the superior part of the trunk have penetrated into the cavity of the abdomen, and where the uterus is affected with inertia, so as to permit the delivery of the foetus by the natural passages.

3d. Where the foetus is entirely in the abdomen.

*Remark.*—When the lower extremities and the inferior part of the trunk are the only parts that have penetrated into the cavity of the abdomen, the delivery should be accomplished by means of the forceps; or if the infant be dead, it will be proper to use the crotchets, provided, however, that the conformation of the pelvis be such as to permit the extraction of the foetus by the natural passages.

*Of the signs which indicate the rupture of the Uterus and the passage of the Infant and its dependencies into the cavity of the abdomen.*

*Rational signs.*—Professor Desormeaux observes: “The noise of the rupture is sometimes heard by the attendants, and there is a sharp and fixed pain where the rupture takes place, which has this peculiarity, that it is sometimes sharp and piercing, and soon after numb. Those who experience this kind of pain are in the habit of designating it by the name of cramp.” The woman feels a slight degree of heat throughout her abdomen, the pulse is feeble, the countenance pale, syncope supervenes, and a cold sweat extends over the whole body, &c.

*Sensible signs.*—The sensible signs are obtained by the touch. If the infant and its dependencies have passed entirely into the cavity of the abdomen, it may be discovered by passing the finger into the vagina; the part of the fœtus that presented will have disappeared, the os tinæ will be closed, and the whole organ will be contracted as after a natural labour. The fœtus may be easily distinguished by passing the hand over the parietes of the abdomen, and, if it be still living, the mother will perceive its motions in a different place from that in which she had previously.

*Indications to be fulfilled.*—As soon as it is known that the fœtus and its dependencies have passed from the uterus into the cavity of the abdomen, we should hasten to perform the operation of gastrotomy (v. page 160), in order to extract them. If the uterus, however, be affected with inertia, it

may be possible to search for the feet of the fœtus and to bring them through the opening, as in the case reported by M. Gardien, and witnessed by Professors Déneux and Roux. This rule for performing the operation of gastrotomy as soon as the infant has passed into the abdomen, should not be weakened by the observations which prove, that in certain cases nature is able to make an artificial passage for the fœtus, and, that in others, the fœtus has remained during more than twenty years in the interior of the abdomen.

#### RUPTURE OF THE VAGINA.

The rupture of the vagina, says Professor Dubois, is certainly an occurrence that takes place more frequently than that of the uterus, with which it is very often confounded, notwithstanding the ease with which it may be distinguished. In fact, the rupture of the uterus diminishes in proportion as the whole organ contracts, while that of the vagina always preserves the same form and extent.

The vagina is generally ruptured at the place where it is united with the uterus, and most frequently in a transverse direction.

If the fœtus has passed through this opening into the cavity of the abdomen, we ought, since the opening always remains the same, to introduce the whole hand into the cavity of the peritoneum, in order to bring back the fœtus so as to deliver it by the feet.

## OF EXTRA-UTERINE PREGNANCIES.

*Definition.*—The extra-uterine pregnancies are those which take place exteriorly to the cavity of the uterus.

*Different kinds of extra-uterine pregnancies.*—Accoucheurs generally admit three kinds of extra-uterine pregnancies: that which takes place in the Fallopian tubes, in the ovaries, and in the cavity of the abdomen. Professor Desormeaux admits a fourth, that which takes place in a cavity formed in the thickness of the tissues of the uterus.

*Characteristic Signs of extra-uterine Pregnancy.*

The signs which distinguish extra-uterine pregnancy are divided into rational and sensible.

The first are perfectly similar to those which distinguish uterine pregnancy.

The second, which can not be perceived until the fourth or fifth month, are derived from an examination, and are drawn principally, first, from the development of the abdomen, which is unequally distended and is raised towards one of the iliac fossæ, or the umbilicus; and secondly, from the motions of the foetus, which may be perceived by traversing the parietes of the abdomen, and especially from the small volume which the uterus presents at the suspected period of pregnancy.

Can the different kinds of extra-uterine pregnancies be distinguished from each other? Professor Desormeaux is of opinion that it is impossible to distinguish whether the foetus be in the Fallopian tube, in the ovarium, or in the cavity of the perito-



neum. Fortunately this distinction is of little importance, since the management is the same in each case.

*Termination.*—Nature is sometimes able to free the woman of an extra-uterine pregnancy; but these fortunate examples are few, while there are many which attest that these kinds of pregnancies most frequently terminate fatally both to the mother and the child!

*Indications to be fulfilled.*—Some surgeons, amongst whom are Sabatier and Levret, afraid of the hemorrhage, which is the inevitable consequence of the separation of the placenta, have advised us to abandon the woman to the resources of nature. But would it not be more reasonable to have recourse to the operation of gastrotomy, since it has been proved by numerous observations, that, by this operation, we may save both the mother and the child?

#### OF GASTROTOMY.

*Definition.*—Gastrotomy is the name of an operation which is performed upon the parietes of the abdomen.

*Instruments, &c.*—The same as in the Cæsarian operation.

*Place of incision.*—The place where the operation of gastrotomy is to be performed, must be determined by the kind of uterine pregnancy. If the fœtus be developed in the cavity of the abdomen, we ought, according to M. Capuron, to make the incision in the place which corresponds to the linea alba; but if it be developed in the Fallopian tube or in the ovarium, the incision should be made at the side which answers to the extra-uterine tumour.

In case the head, after being engaged in the small pelvis, projects into the vagina, we should cut upon it through the corresponding paries of that canal, in order to extract the fœtus and its dependencies by the natural passages.

*Time when the operation should be performed.*

*Time of necessity.*—We are obliged to perform this operation when the uterus has been ruptured, and the fœtus has passed from it into the abdomen, and on account of the death of the fœtus and the causes which produced it.

*Time of election.*—If none of the preceding causes be present, at what time ought we to perform the operation? Ought we to wait for a certain time for the efforts of nature; or should they be prevented? Authors are not agreed upon this subject, though it would appear more reasonable to act before the supervention of the causes which often determine the efforts of nature to come on suddenly.

*Operation.*—The operator must proceed precisely in the same manner as in the Cæsarian operation; only, instead of opening the uterus, he must open the cyst which contains the product of conception. The fœtus is to be extracted in the same manner as in the Cæsarian operation.

The delivery of the after-births is unquestionably the most difficult and dangerous part of the whole operation, for the separation of the placenta must necessarily give rise to hemorrhage which can not be arrested, like that of the uterus, by the contraction of the part into which this organ is inserted. If we consider, however, as Professor Desormeaux observes, that the placenta is sometimes so thin and delicate as

to resemble a membrane, and that its vessels are so small that they can scarcely be traced with the scalpel, we should suppose that its separation could not always be so dangerous as we might imagine. We should not, therefore, abandon it to the resources of nature, nor wait until it is detached and presents at the wound in the parietes of the abdomen.

*Treatment after the operation.*

When we perform this operation, says M. Gardien, it is exceedingly important that the woman should suckle her infant, in order to counterbalance the irritation which is generally created in the peritoneum, and which constitutes one of the most serious affections that we have to combat. The operator should take care to keep open the wound, in order that the extravasations which take place into the abdomen may escape, and to throw injections into that cavity from time to time, in order to remove the fluids and produce their absorption.

The general treatment is the same as in the Cæsarian operation.

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## SECTION IV.

### OF THE ARTIFICIAL DELIVERY OF THE SECUNDINES.

*Definition.*—The artificial delivery of the secundines is that kind of delivery, which can not be confided to the efforts of nature, and therefore, demands the interference of the obstetric art.

In order to facilitate our knowledge of every



thing that relates to this kind of delivery, we shall say a few words upon the mechanism of the natural delivery of the secundines.

The mechanism of the delivery of the secundines, according to Professor Desormeaux, presents three distinct periods. In the first, the placenta is detached from the internal surface of the uterus; in the second, it is expelled from the cavity of that organ into the vagina, and in the third, it passes the vulva.

#### MECHANISM OF THE NATURAL DELIVERY OF THE SECUNDINES.

The most fortunate cases of this kind of labour are those in which the placenta is rolled upon itself in the form of a cupping-glass, in proportion as it is detached, and presents at the os tinæ the apex of the cone which it represents. Pressed by the contractile efforts of the uterus, it soon passes the cervix uteri, in the direction of the axis of the superior strait of the pelvis, and having arrived in the vagina, it is in a short time expelled through the vulva, in the direction of the axis of the inferior strait. Here the placenta no longer receives the contractions of the uterus, and is, as Professor Desormeaux observes, expelled by the falling down of that organ. The membranes are discharged after every other part of the after-births has been delivered.

Sometimes the placenta, instead of offering its border, presents its foetal surface; in this case the delivery of the secundines is somewhat more difficult.



## OF THE ARTIFICIAL DELIVERY OF THE SECUNDINES.

*General causes.*—Hemorrhage, convulsions, syncope, inertia of the uterus, spasmodic contractions of its neck, preternatural adhesions of the placenta, its retention, its insertion into the cervix uteri, abortion and compound pregnancy.

Amongst all these causes, there are some, such as hemorrhage, convulsions, and syncopies, which demand a prompt delivery; while others, such as inertia of the uterus, the spasmodic contraction of its neck, the preternatural adhesions of the placenta, &c., permit or oblige us to retard the delivery.

*Of the manner of producing artificial delivery of the Secundines.*

This operation may become necessary, either when the placenta is detached, or when it still adheres to the uterus.

*In the first case*, if the umbilical cord still remains and presents a certain degree of resistance, the delivery may, in general, be easily accomplished. In fact, it will be sufficient, in order to effect its separation, to pull upon the cord in the direction of the axis of the pelvis; and to accomplish this, it will be necessary, at the same time that we pull with one hand at the foetal portion of the umbilical cord, to place the index and middle fingers of the other into the vagina, above the cord, in order to form a kind of pulley, which shall direct the first tractions in the direction of the axis of the superior strait.

When the placenta has arrived in the vagina, the

accoucheur should remove it in the direction of the axis of the inferior strait, by elevating the hand, and by carrying it alternately from one thigh to the other. As soon as it presents at the vulva, he should carry one of his hands in front of the perineum in order to support it, and also to receive the placenta, which he rolls up, without removing it from the parts of generation. By this last manœuvre, he obliges the membranes to roll themselves into a kind of cord, which renders their complete extraction more sure.

*In the second case*, that is, when the placenta is still adherent to the internal surface of the uterus, if the tractions upon the cord be not sufficient, we ought, above all things, to introduce one of the hands into the organ, in order to produce its separation. If the cord still remains, it should serve as a guide to the hand, which ought to be introduced according to the same rules and with the same precautions as in cases of preternatural labours.

When a part of the placenta is detached, the accoucheur carries his hand into the uterus, and glides it between that part and the internal surface of the uterus, until he has completely separated it. If the placenta be still adherent in every part of its surface, he should begin by detaching one of the points of its circumference, and proceed as in the preceding case. When it has been detached in its middle, and is only adherent by its circumference, Professor Desormeaux advises us, after Baudelocque, to pierce its centre, and to carry the fingers through that opening, in order to effect the separation with more facility.

In cases where a portion, or even the whole of the placenta adheres too firmly to be detached by the

method which we have just indicated, it would be better to leave behind such portions as can not be extracted.

When the placenta has been detached, the accoucheur should draw it out with one hand, taking care at the same time, to bring away the portions which may be insulated, and the clots which are within the uterus. (M. Desormeaux.)

*Remark.*—In the delivery of the secundines, in cases of abortion, as it is impossible to introduce the hand into the uterus, we ought, in cases of accident, to extract the placenta by means of two fingers, or with a pair of Levret's forceps.

A  
PHYSIOLOGICAL MEMOIR  
UPON THE BRAIN,

BY M. MAGENDIE:

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FROM THE FRENCH, .

BY JOSEPH GARDNER, M. D.





# APPENDIX.

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## A PHYSIOLOGICAL MEMOIR

UPON

### THE BRAIN.

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SINCE the blind and barren respect which the ancients professed for the dead, has given place to an ardent and enlightened desire to become acquainted with the wonders of the organization of the human body, anatomical science, by the constant labours of a host of distinguished men, has been gradually elevated to a high degree of perfection. There is not one of the numerous solid or liquid elements, whose admirable union constitutes our bodies, that has not been the object of an attentive study and exact description. We have engravings and lithographic prints, which represent in the most exact manner all our organs; and more than this—within a few years there have been constructed of pasteboard, models of the human frame, which are such excellent imitations, as to be of essential service to students of medicine.

In short, those anatomists, who, in the ardour of their zeal, still preserve the hope of finding some part hitherto unobserved, some peculiarity of structure unknown to their predecessors, pursue their labours with the aid of the magnifying power of

lenses. This alone will suffice to demonstrate what is the actual state of the topography of the human body.

The researches which I have for a long time pursued upon the functions of the nervous system, have, much to my gratification, enabled me to discover a new element of our organization; not one of those, which to be demonstrated requires minute research and delicate instruments; but, on the contrary, the element of which I speak, is so apparent, and occupies so much space, that it must have hitherto escaped observation only in consequence of the belief, in other respects well founded, that no part of the body, however minute, could have escaped the active investigations of anatomists.

I have discovered that there exists in the cavity of the cranium and spinal canal, a liquid which surrounds the brain, spinal marrow, and origin of all the nerves. This liquid, which exists in a state of perfect health, its quantity amounting to several ounces, is too apparent to have passed unnoticed by several writers; but its presence has been attributed either to a state of disease, for which means of cure have lately been proposed, or to those physical changes which death produces in our organs.

The gratifying satisfaction I experienced on ascertaining the reality of a fact so important, can only be appreciated by you, gentlemen, who have experienced the lively pleasure arising from the free and independent cultivation of science.

I was assailed by a crowd of conjectures concerning the functions of this fluid: was not the liquid which I had discovered, the *animal spirits*, of which ancient anatomists and modern metaphysicians have spoken so much without ever having seen

it? was it not the *nervous fluid* concerning which, certain physiologists still amuse us, without having critically examined it? was it rather the *vital fluid*? &c.—Had this discovery been made only fifty years since, it would doubtless have served as a foundation for a brilliant hypothesis, explaining every thing, whether capable of being resolved, or beyond the reach of human intellect.

Such is not the march of science in our day. Thanks to the progress of good sense, experience is preferred to the most ingenious system, and the most simple truth is more fascinating than all the delusions of the imagination.

The following pages contain the observations and experiments which I have made, both upon the human subject and upon animals.

I have already had the honour of communicating to you a part of my researches: I again ask permission to present them to you, together with a great number of new results, which I have obtained from my experiments.

It is necessary in the commencement, to give a name to my liquid—a name is an important appendage to an object in the science of anatomy. I have called it the *cephalo-spinal liquid*, (or *cephalo-rachidian*, for those whose ear might be wounded by an hybridous word,) because it exists at the same time in the cranium and cavity of the spine.

It is necessary in the second place to state the exact quantity of the liquid. I have discovered that an adult of ordinary stature, and in the full enjoyment of his moral and physical faculties, has about three ounces; women, *cæteris paribus*, have a greater quantity. In old men, the proportion of the cephalo-spinal liquid is still greater, and in some



cases it may amount to six or seven ounces, but under these circumstances, the mental and corporeal energies are generally greatly enfeebled.

The locality of the liquid is worthy of remark; it forms a layer around the brain and spinal marrow which varies in thickness according to its situation; in the neck it is four or five lines; in the lumbar region it is more than an inch, around the brain it is generally one or two lines, and in certain cases and situations it approaches an inch in thickness.

Do not the above facts form a powerful objection against a famous system, which pretends at nothing less than divining the most minute peculiarity of the volume and conformation of the brain, from an examination of the dimensions and conformation of the cranium? If there exist, which no one can doubt, a layer of liquid between the cranium and the brain, and if this liquid is several lines in thickness, how is it possible to judge of the dimensions of the brain from an examination of the cranium, and how can any one be confident that the protuberances and depressions upon the surface of the head do correspond with a similar configuration of the brain?

The study of the liquid layer which clothes the brain has led me to a very singular fact, hitherto entirely unobserved, respecting the volume of this organ.

The volume of the brain is represented as invariable, because it is supposed completely to fill the cavity of the cranium, and we never observe the head to become diminished or enlarged as other organs of the body; but nothing is less true: I am confident that the size of the brain always corresponds with the changes which take place in the volume of the other organs of the human body.

In all diseases of a certain duration, in which the body becomes much emaciated, the brain undergoes an analagous diminution, and the convalescent who can stand with difficulty, and supposes his weakness to arise from the almost total disappearance of the muscles of his legs, can with much greater reason, attribute his mental enervation to the diminution of the volume of his brain.

I have discovered that in proportion as the emaciated organs regain their former dimensions, the brain also recovers that which it had lost.

Thus one of the offices of the cephalo-spinal liquid, is to fill up the cavity produced by the diminished volume of the brain, as frequently as that occurrence takes place. It answers the same purpose in cases of partial diminution, of which I have convinced myself, from an examination of those persons who, during many years of their lives, have had immovable contractions of their limbs. In these cases a fifth or a fourth of one of the cerebral lobes had disappeared, a large cavity was formed upon the surface of the organ, and completely filled by the cephalo-spinal liquid.

What an admirable diversity of means are employed by nature! The viscera of the thorax and abdomen frequently diminish in volume; but the parietes of those cavities, being flexible and pressed upon by the atmosphere, follow the retreat of those organs, and a cavity is thus avoided. But on the contrary, the parietes of the cranium being inflexible, can not follow the brain when its volume decreases; it is therefore necessary that the cephalo-spinal liquid should be present in order to occupy the space which the brain has abandoned.

After having discovered what were the physical

uses of the cephalo-spinal liquid, I determined to pursue my researches for the purpose of discovering whether it exercised any influence upon life. In order to solve this curious and interesting question, it was necessary to have recourse to experiments upon animals, which also have a cephalo-spinal liquid, the quantity however being much less than occurs in the human body.

I made my first experiment upon a fox that had been caught in a snare; he was old and fierce, and evinced no disposition to serve in the advancement of science. However, by means of a small puncture which I made in the nape of the neck, his cephalo-spinal liquid was in a few moments evacuated: the effect which followed was extremely striking: this animal, ferocious a moment before, became suddenly calm: he no longer made efforts to bite, and lay upon the ground without making the least movement. Seeing the animal in this disposition, I loosed it and set it at liberty in my garden, but it lay upon the ground and did not attempt moving its position until the next morning. It then began to show a disposition to rise, and during the course of the day was enabled to walk several steps: in the space of thirty-six hours, it again endeavoured to bite and make its escape. I then made a new puncture in the neck, and convinced myself that the cephalo-spinal liquid was completely restored. So that by this experiment, which I repeated in many different ways, I discovered much more than I had sought—that it not only exercises a great influence upon the movements and instinct of animals, but that it is speedily reproduced.

These experiments led me to examine with much more attention than I had hitherto done, a disease



of infants in which there occurs at the inferior extremity of the spine, a sac filled with water a situation where the natural liquid exists in the greatest quantity. I discovered the liquid filling the sac, which has always been regarded as a consequence of disease, to be nothing but the natural fluid having distended its envelopes, and had produced a hernia in that situation. When this sac became ruptured the fluid escaped, and the death of the infants was the sudden consequence, probably because the orifice remaining pervious, the cephalo-spinal liquid could not remain in the vertebral canal, and protect, by its presence, the brain and spinal marrow.

Thus, not only with men, but animals, the contact of the cephalo-spinal liquid with the brain is of the utmost consequence in preserving the integrity of the nervous functions, as well as being necessary for the continuance of life.

But is it only as a liquid that this fluid is of so much importance? Does not its chemical nature influence it? To prove this I made an experiment in which, after having evacuated the cephalo-spinal liquid of an animal, I injected in its place distilled water in equal quantity and at the same temperature, and was surprised to see the animal fall into extreme agitation—its movements were perverted, and it seemed to have completely lost its instinct and habits. But on permitting the water which I had introduced to escape, the animal regained its natural condition.

In order to judge whether the temperature of the liquid has also an effect upon the functions of the nervous system, I cooled the natural liquid which I had previously extracted from an animal and again introduced it into the cavity which it had occupied.



The animal was seized with a general shivering, similar to that which precedes the hot stage of intermittents. It may not be impossible that this experiment will throw some light on the hitherto unknown cause of the cold and shivering stage of fevers.

I therefore conclude from these facts and preceding experiments, as well as from many others which have been already published, that the cephalo-spinal liquid exercises an influence over the functions of the nervous system, 1st, by its contact with the brain and spinal marrow; 2d, by its chemical properties; 3d, by its temperature, and that therefore this liquid, in consequence of its great utility in the animal economy, is worthy to be ranked with the blood, the lymph, &c.

But I still have a subject of research much more important than any which has yet occupied us—it is concerning the influence which the cephalo-spinal liquid exercises over the intellectual faculties of man, a subject which requires the greatest circumspection in my investigations, as well as the utmost severity in my deductions.

To place every one in a condition to follow me and more fully understand the nature of my researches, I am under the necessity of saying a few words upon the conformation of the brain. I will be brief—nevertheless, it is of the utmost importance to have an intimate knowledge of that organ in which the inexplicable phenomenon of thought—that principal which is the most intimate and elevated of our nature, operates.

The brain, that mass of nervous matter which fills the interior of the cranium, is divided into two portions. The larger, which occupies the whole supe-

rior part of the cranium, is called the cerebrum, and the other, which is placed beneath, is called the cerebellum. The exterior surface of the brain presents a great number of convolutions, which vary in number in different individuals, and are separated by deep sulci. This arrangement has induced some authors to believe that the brain is only a large membrane folded upon itself.

There are several cavities in the centre of the brain, and it is in them most probably that some of the mysterious secrets of the intellectual functions take place. Can it be believed that these cavities, so important from the phenomena which they produce, have been and still are called ventricles, that is to say, *little bellies*. Let it be added, however, to the honour of modern anatomists, that this epithet is derived from the ancients, with whom it was in such esteem that they applied it to every thing. That which we call the thorax, was termed by them a belly. The stomach was but lately termed a ventricle. The heart has still its two ventricles. Each muscle has a belly, hence the degastric muscles. In a word the brain, because it is undoubtedly the most noble of all our organs, has nothing less than four little bellies—is it not time that this trivial nomenclature should be removed from anatomical language.

Be this as it may, the nomenclature of the brain presents a very remarkable and striking circumstance, to which I will now call your attention. Several of these parts have names which are used in hydraulics—here is an aqueduct—there a funnel—in another place a valve, and, in fine, there is even a bridge.

The most of these terms may be traced to remote

ages—they are still in use, but they are considered only as the vestiges of an ancient system, which time and the progress of science are hastening on to ruin.

What this ancient system was we are unable to say. Physicians, however, for a long time believed that the cavities of the brain were filled with water, which in certain cases escaped by the nose—a belief which passed among the vulgar and with whom it still exists. These ideas are regarded as erroneous by practical anatomists, according to whom the cavities of the brain do not contain any water in the healthy state, but a light, invisible vapour, which they do not hesitate to represent as the immaterial substance which presides over the operations of intelligence.

Nevertheless, when we open a brain, we find its ventricles almost always filled by a limpid fluid, which anatomists are in the habit of regarding as the product of the disease which caused the death of the individual.

After having acquired the knowledge of the liquid which surrounds the brain and spinal marrow, I concluded, that the water which is so found in the cerebral cavities, must be the same humour which is found at the surface of the brain—from whence it results, that it naturally exists in the ventricles as was supposed by the ancient physicians, and is not, as is believed at the present day, the effect of disease.

I conceived, however, that, in order to confirm this conjecture, it was absolutely necessary that there should exist a communication between the exterior of the organ and its internal cavities—a communication, however, which had never been discovered. How has it escaped the numerous



modern investigators of the brain? but as the cephalo-spinal liquid has not been noticed by them, I did not despair; and in fact, after examining the brains of several subjects, I at length found an opening of two or three lines in diameter, completely concealed by a lobe of the cerebellum, and forming a true entrance into the cavities of the brain.

I have represented this opening on a fine wax preparation which I presented to the Academy, and which is now exhibited at M. Dupont's museum.

This fact once established, it became mechanically necessary that the cephalo-spinal liquid should enter into the cavities of the brain and fill them, in consequence of their communicating with each other. I had little difficulty in verifying this deduction upon the bodies of individuals who had been killed by accident, and in whom I discovered a liquid which filled the cavities of the brain, and which immediately communicated with that which surrounds the brain and spinal marrow.

This discovery gave me the key of the hydraulic nomenclature, to which I have just alluded. I saw that these supposed ruins of ancient systems were simply the figurative but just designation of a collection of organs in full activity, and performing their peculiar functions in the brains of those very persons who denied their existence or contested their mode of action. In fact, what is at present called the great valve of the brain, performs to a certain extent the office of a valve. The aqueduct has really those functions which its name indicates, since it conducts the cephalo-spinal liquid from the fourth into the third ventricle. The infundibulum, or funnel, conveys the liquid to the pituitary gland—in a word, the bridge is truly an arch which



traverses the current of the liquid. This bridge is established, not above, but below the current which it passes, and in order to give you an idea of it, I can not do better than call your attention to the gigantic enterprise which is now executing under the Thames.

Behold then a complete restoration of the monument, or, to be more modest and exact, of the hydraulic apparatus which the brain presents—without being an exclusive flatterer of past times, I am obliged to grant that in this circumstance we have examined much less critically than our predecessors. Modern anatomists, however, in this case deserve praise in preserving those terms, although they regard them as false and illegitimate. In this they are wise, as men sometimes are in the affairs of this life, without being aware of it.

The liquid which fills the cavities of the brain is never in repose—it experiences a continual agitation in consequence of a kind of flux and reflux, which takes place under the influence of respiration. Thus, at the moment when we draw the air into the thorax for the purpose of respiration, a proportion of the liquid flows from the cerebral cavities into the spinal canal—at the moment, on the contrary, when we drive the air from our lungs by expiration, the liquid re-enters these cavities by traversing the passages above mentioned, and particularly by running through the aqueduct, which thus at different times conducts the liquid in opposite directions.

The mechanical cause of the flux and reflux of the cephalo-spinal liquid is very simple—it is produced by the alternate swelling and depression of the veins, caused by the blood under the influence of respiration. This movement of the liquid may be arrested, or at least much retarded by compressing

the abdomen—and this will explain the cause of belts proving injurious and even dangerous, whenever the pressure which they exercise is too considerable.

Whilst observing the movement of the liquid through the aqueduct, I believe I discovered the probable use of the pineal gland, a small body placed in the centre of the brain, and which has preserved a certain degree of celebrity since the time of Descartes.

This philosopher, who, notwithstanding the extent and vigour of his mind, yielding frequently to the propensity which we ourselves experience, in filling with our illusions the immense space which is beyond the boundary of vision and intellect, has given an hypothesis, not upon the throne of the soul, as has been remarked, but upon the situation in which it exercises its functions, and upon the throne of the imagination and of common sense, all of which he places in the pineal gland.

Voltaire, who delights in metaphysics, but loves still more to mock metaphysicians, has made a facetious parody upon the supposition of Descartes, which has been more successful than the hypothesis itself—for anatomists to the present day apply the term reins of the soul to two nervous peduncles, which, according to Voltaire, are the guides by which the pineal gland, which he compares to a coachman, directs the movements of the two hemispheres of the brain.

The functions of the pineal gland, which I propose to substitute for the hypothesis of Descartes, are very humble—but I believe them to be true, and that is a merit which, in science, ought to precede every thing. I regard the pineal gland as a tam-

pon, for the purpose of opening and closing the aqueduct of the brain. The gland is, in fact, placed above the anterior opening of the aqueduct. Two voluminous veins are firmly placed upon the gland. These veins vary in size, being sometimes very much swelled, and at others nearly empty. It is inevitable, from the relative position of the parts that, at the moment when the veins are swelled, they must press down the pineal gland, and that this can not take place without closing more or less tightly the entrance of the aqueduct of the brain. But as one of the constant effects of violent exercise, crying, rage, and the exercise of any of the passions, is to swell considerably the veins of the head, and particularly those which press upon the pineal gland, it results, that in three different conditions, the entrance of the cephalo-spinal liquid into the ventricles must be intercepted, or at least rendered much more difficult.

The office, or to speak more correctly, one of the offices of the pineal gland, must be, therefore, an indispensable mechanical agent, for the purpose of more or less completely closing the aqueduct of the brain, and to modify, according to circumstances, the motion of the cephalo-spinal liquid, as it enters or flows from the cerebral cavities.

I come now to speak of the most important, and at the same time, the most interesting question which the study of the cephalo-spinal liquid can possibly present. What influence has this fluid upon the exercise of the intellectual faculties?

In a research, so delicate as this, and one, which presents a prospect of arriving at the most important and interesting results, the chances of committing error must be exceedingly numerous.



In order, therefore, to avoid error as much as possible, I have endeavoured to determine the extreme points, reserving to myself, if it should be desirable, the opportunity of noticing, at a subsequent period, the intermediate facts.

I will therefore state the quantity of the cephalo-spinal liquid, first, as it occurs in the sane; second, as it occurs in the imbecile; and, third, as it occurs in idiots.

The details of the researches which I have made at the Salpetriere, where there are a great number of fools, idiots, and sane women, I am sorry to say, are too numerous to find a place in this paper:—I must be satisfied, therefore, by mentioning the principal results.

In speaking of idiots, I have reference to those who have become so accidentally, not of idiots from birth, in whom there exists some mal-conformation of the nervous system.

The idiots of whom I speak, present a considerable quantity of the fluid. It occupies the surface of the brain, under the form of a thick layer, and distends the cerebral cavities, displacing all the organs which they contain, and particularly the pineal gland, which neither retains its ordinary position, nor performs those functions which I have attributed to it. The aqueduct is also often considerably enlarged. It is in these cases that the cephalo-spinal liquid may be found to amount to six or seven ounces; and the same circumstance obtains in cases of old persons who suffer from mental derangement.

Fools likewise present a large quantity of the liquid; but it does not accumulate upon the surface of the brain. Whatever may be the variety of derangements, whether monomania, hallucination of



the mind, furious mania, melancholia, &c., the ventricles are always much distended and enlarged by the cephalo-spinal liquid. In such cases, three ounces of the liquid have been found in the ventricles alone.

The brains of those endowed with reason contain, in a majority of cases, less than an ounce of liquid in their ventricles at the moment of death. From this circumstance it is easy to distinguish the brain of an idiot from that of a sane person.

I was once under the painful necessity of examining the brain of a man of genius who died at an advanced age, but who enjoyed the plenitude of his intellectual faculties. The entire quantity of the cephalo-spinal liquid contained in his brain and spinal canal was scarcely two ounces, and the cerebral cavities did not contain a drachm.

These general results seem to establish the fact, that the development of the mind is in inverse ratio to the quantity of the cephalo-spinal liquid, a circumstance which, to a certain extent, is easy of comprehension, since the quantity of the liquid can not be increased, but at the expense of the mass of the brain, and that, in general, superior intelligence is observed in those who have voluminous and well formed brains.

Thus, those persons who have a large head, a high and expanded forehead, and who attach a certain degree of vanity to this conformation, should not be without inquietude respecting the relative proportion of their cephalo-spinal liquid.

I will add in this place, that this liquid should not be too abundant, and that its passage through the cavities of the brain and spine should be perfectly free and uninterrupted. I lately found in the brain of

an aged singer, who, after having shone in our theatre, died an idiot in the Salpetriere, an obliteration of the opening by which the liquid entered into the ventricles; and as the brain of this female presented nothing else by which I could explain the disease of her mind, I was led to regard the obliteration of the opening into the ventricles as a cause, or one of the causes of her idiocy.

You see, gentlemen, where my researches have led, but you also observe what remains to be performed in order to obtain a complete history of the cephalo-spinal liquid, whether considered in a state of health or disease.

I have already collected a great number of facts; and I believe I have obtained several interesting results, but I can not present them before you until I have sufficiently verified and perfected them.

I must therefore terminate this memoir, hoping that the importance and novelty of a subject so extremely interesting, will be an ample apology for the minute details into which I have been obliged to enter.



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